SERIES P

FULL KEYBOARD

ADDING and BOOKKEEPING MACHINES

SECTION IX

Burroughs

FIELD ENGINEERING

TECHNICAL MANUAL

SERVICING PROCEDURES

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INDEX

PREVENTIVE MAINTENANCE GUIDE

CLASSES 8, 9, 10, SERIES P 100 THRU P 400 AND SERIES P 1200 THRU P 2200

Each Preventive Maintenance Inspection is to be directed toward the cleaning, correct lubrication and adjustment of the machine. Throughout the inspection, particular attention should be given to the condition and operation of parts and mechanisms. Parts showing evidence of pending mechanical failure should be replaced.

It is also important that "Reliability Improvement Notice" parts be installed at the time of the "Preventive Maintenance Inspection" when use of such parts will improve performance, minimize customer interruptions and reduce service time.

APPROVED LUBRICANTS AND CLEANING AGENTS

1. Machine Oil 1624 9245 - to be used to fill dashpots and oil all shaft bearings, pivot points, rollers, oil holes and metal to metal contact of moving parts.
2. Machine Grease 1624 9427 - to be used on all cams, forked arms and slots where contact is made with studs and heavy working parts.
3. Drive Oil 1624 9401 - to be used in enclosed drive clutch and gear cases.
4. Case Cleanser and Polish 1624 9146 - (soap and water if real dirty) to be used for cleaning cases and bases.
5. Platen Restorer S3 - to be used to clean the platen, pressure rolls and twirlers.

MAINTENANCE

1. Inquire of the operator whether the machine has been performing satisfactorily and if any peculiarities of operation that may require correction have been observed.
2. Perform operating tests on the machine, following the suggestions given in "Operating Tests", Section IX, Page 7, Series P Instruction Book.
3. Check the machine speed.
4. Check the outside surface of the machine for loose fittings, defective or missing parts and oil leaks around the rubber feet.
5. Inspect the carriage.
   a. Check the condition of platen, pressure rolls, twirler, paper guides and springs.
   b. Clean platen and pressure rolls with platen restorer S3.
   c. Clean all carriage parts, apply oil 1624 9245 to bearings for platen shaft and pressure rolls.
   d. Test the paper feed tension of the platen and pressure rolls by manually holding the paper in the opposite direction to the paper feed during paper spacing.
   e. Check the ribbon feed and reverse, apply a light amount of grease 1624 9427 in the two pockets of the detent portion of the ribbon feed arms also on the two posts on which the ratchet gears pivot.
6. Remove the roll paper, case, carriage and machine base.
7. Inspect the Keyboard Mechanism.
   a. Clean between the keys with a keyboard brush or cleaning cloth.
   b. Check all keystems for free action and interlocks for proper function and good condition.
   c. Lubricate the keyboard, apply oil 1624 9245 being sure to remove all excess oil.
8. Inspect the Printing Mechanism.
   a. Clean the type bars by raising all the type to "nine" position and brush the type faces with a wire brush. Then raise each type bar individually to "Nine" position and wipe both sides of the type bar with a cleaning cloth.
   b. Check the type bars for freedom of movement, up and down, as well as forward and back.
   c. Check the peculiarities in the printing mechanism that were observed when performing the machine operating tests.

d. Lubricate the printing mechanism, apply oil 1624 9245.
e. Check the condition of the ribbon with the operator and recommend a new one if any question as to its condition.

9. Inspect the Power Section
a. Lubricate all cams and rollers on the primary and secondary sections; apply grease 1624 9427.
b. Check the dashpot for proper oil level, fill if required, use oil 1624 9245.

NOTE: The following steps apply to electric machines:

c. Check condition of wires and connections.
d. Check governor weights and pin for being free, lubricate with oil 1624 9245.
e. Check the governor switch points for condition.
f. Check brushes for free movement in brush holder and clean if necessary. Replace brushes if worn.
g. Remove all carbon dust.
h. Add oil to the drive if necessary to bring oil level up to within 1/8" of filler opening; use drive oil 1624 9401.
i. If machine speed is questionable, check for correct crank speed of 144 to 147 strokes per minute as outlined in test and adjustment 6C, Page 38, section II, Series P Instruction Book.

10. Inspect the Accumulating Mechanism
a. Check any peculiarities of the accumulating mechanism that were observed when performing the machine operating tests.
b. Check the adding pinions for freedom of movement.
c. Check the accumulator meshing controls for proper functioning.
d. Check the carry pawls, carry pawl latches, carry racks and carry rack latches for being free.
e. Lubricate the accumulator; use oil 1624 9245.

11. Inspect the Right Side Frame Section
a. Check for loose screws, nuts and damaged springs.
b. Check for all parts assembled on the outside and inside of the frame for general condition, free action, alignment, latching lead and adjustments.
c. Apply oil 1624 9245 to all pivot and bearing points.

12. Inspect the Left Side Frame Section
a. Follow the same procedure as outlined in step 11 above.

13. Test machine functions to be sure that any peculiarities pointed out by the operator or observed while performing inspection have been corrected.
14. Reinstall the machine base, case and carriage.
15. Clean all keytops and motor bars.
16. Ask the operator to test the machine while you are engaged in making out your report.

PREVENTIVE MAINTENANCE GUIDE

SERIES P 600 MACHINES

Each Preventive Maintenance Inspection is to be directed toward the cleaning, correct lubrication and adjustments of the machine. Throughout the inspection; particular attention should be given to the condition and operation of parts and mechanisms. Parts showing evidence of pending mechanical failure should be replaced.

It is also important that "Reliability Improvement Notice" parts be installed at the time of the "Preventive Maintenance Inspection" when use of such parts will improve performance, minimize customer interruptions and reduce service time.

APPROVED LUBRICANTS AND CLEANING AGENTS

1. Machine Oil 1624 9245 - to be used to fill dashpots and oil all shaft bearings, pivot points, rollers, oil holes and metal to metal contact of moving parts.
2. Machine Grease 1624 9427 - to be used on all cams, forked arms and slots where contact is made with studs and heavy parts.
3. Drive Oil 1624 9401 - to be used in enclosed drive clutch and gear cases.
4. Case Cleaner and Polish 1624 9146 - (soap and water if real dirty) to be used for cleaning cases and bases.

5. Platen Restorer S3 - to be used to clean the platen, pressure rolls, and twirlers.

MAINTENANCE

1. Inquire of the operator whether the machine has been performing satisfactorily and if any peculiarities of operation that may require correction have been observed.
2. Perform operating tests on the machine; following the suggestions given in "Operating Tests", Section IX, Page 7, Series P Instruction Book.
3. Check the machine speed.
4. Check the outside surface of the machine for loose fittings, defective or missing parts and oil leaks around the rubber feet.
5. Inspect the Carriage
   a. Remove the machine case and base.
   b. Check the condition of platen, pressure rolls, twirler, paper guides and springs.
   c. Clean platen and pressure rolls with platen restorer S3.
   d. Test the pressure rolls for free rotation and adequate lubrication.
   e. Check the carriage raceways for condition and for being properly adjusted as outlined in Fig. VII-4, Page 8, Section VII, Series P Instruction Book.
   f. Lubricate carriage raceways - use machine grease 1624 9427.
   g. Remove the right and left carriage end covers and check parts for general condition and proper lubrications, apply oil 1624 9245 to all pivot and bearing points.
   h. Check the automatic carriage opening mechanism for proper function.
   i. Check for proper paper feed. Replace carriage end covers.
   j. Check the ribbon feed and reverse mechanism for proper function.
6. Inspect the Keyboard Mechanism
   a. Clean between the keys with a keyboard brush or cleaning cloth.
   b. Check all keystems for free action and interlocks for proper function and good condition.
   c. Lubricate the keyboard; apply oil 1624 9245 being sure to remove all excess oil.
7. Inspect the Printing Mechanism
   a. Clean the type bars by raising all type to "nine" position and brush the faces with a wire brush. Then raise each type bar individually to "nine" position and wipe both sides with a dry cloth.
   b. Check the type bars for freedom of movement, up and down as well as forward and rearward.
   c. Check any peculiarities in the printing mechanism that were observed when performing the machine operating tests.
   d. Check the four position printing control mechanism.
   e. Lubricate the printing mechanism; apply oil 1624 9245.
   f. For machines constructed with red ribbon mechanism as described in Fig. VI-17, Page 14, Section VI, Series P Instruction Book; apply grease 1624 9427 to the forked portion of friction plate C.
   g. Check the condition of the ribbon with the operator and recommend a new one if there is any question as to its condition.
8. Inspect the Power Section
   a. Lubricate all cams and rollers on the primary and secondary sections; apply grease 1624 9427.
   b. Check the dashpot for proper oil level; fill if required. Use oil 1624 9245.
   c. Check condition of wires and connections.
   d. Check governor weights and pin for being free; lubricate with oil 1624 9245.
   e. Check the governor points for condition.
   f. Check brushes for free movement in brush holder and clean if necessary. Replace brushes if worn.
   g. Remove all carbon dust.
   h. Add oil to the drive if necessary to bring oil level up to within 1/8" of filler opening; use drive oil 1624 9401.
   i. If machine speed is questionable; check for correct crank speed of 144 to 147 strokes per minute as outlined in test and adjustment 6C, Page 38, Section II, Series P Instruction Book.
9. Inspect the M. R. C. Unit
   a. Examine drive belts for condition. Replace belts if any slight degree of wear or damage is found.

b. Check the mesh and alignment of the rack gear and rack bar as outlined in test No. 1, Fig. VII-23, Page 22, Section VII, Series P Instruction Book.
c. Apply oil 1624 9245 to all pivot and bearing points and grease 1624 9427 to all gears.

10. Inspect the Accumulating Mechanism
a. Check any peculiarities of the accumulating mechanism that were observed when performing the machine operating tests.
b. Check the adding pinions for freedom of movement.
c. Check the accumulator meshing controls for proper functioning. Minimum play in both positions.
d. Check the automatic totaling mechanism in those machines containing this feature.
e. Lubricate the accumulating mechanism; use of oil 1624 9245.

11. Inspect the Right Side Frame Section
a. Check for loose screws, nuts and damaged springs.
b. Check all parts for wear and freedom of movement.
c. Check all controls and interlocks to function properly.
d. Lubricate all moving and pivot points; use oil 1624 9245.

12. Inspect the Left Side Frame Section
a. Follow the same procedure as outlined in step 11 above.

13. Test machine functions to be sure that any peculiarities pointed out by the operator or observed while performing inspection have been corrected.
14. Reinstall the machine base and case.
15. Clean all keytops and motor bars.
16. Ask the operator to test the machine while you are engaged in making out your report.

OPERATING TESTS SERIES P

SERIES P MACHINES EXCEPT SERIES P 400 AND P 600

1. Make a test run of the complete keyboard and all symbols. This test provides a means of checking for wrong accumulation, type alignment, printing impression, damaged or worn type and listing and totaling capacity.

```
                    .0 0 *
9 9,9 9 9,9 9 9.9 9
8 8,8 8 8,8 8 8.8 8
7 7,7 7 7,7 7 7.7 7
6 6,6 6 6,6 6 6.6 6
5 5,5 5 5,5 5 5.5 5
4 4,4 4 4,4 4 4.4 4
3 3,3 3 3,3 3 3.3 3
2 2,2 2 2,2 2 2.2 2
1 1,1 1 1,1 1 1.1 1
9 9,9 9 9,9 9 9.9 5 •
                .0 5
                .0 0 *
                .0 0 //
                .0 1 -
                .0 1 -•
                .0 1 -*
                .0 0 -*
1 1,1 1 1,1 1 1.1 1
2 0,2 0 2,0 2 0.2 0 -
  9,0 9 0,9 0 9.0 9 -*
                .0 0 -*
```

2. Check for shadow printing by performing the following test:

```
                    .0 0 -*
                    .0 0 -*
9 9,0 0 0,0 0 0.0 0
9 9,0 0 0,0 0 0.0 0
  9,9 0 0,0 0 0.0 0
  9,9 0 0,0 0 0.0 0
    9 9 0,0 0 0.0 0
    9 9 0,0 0 0.0 0
      9 9,0 0 0.0 0
      9 9,0 0 0.0 0
        9,9 0 0.0 0
        9,9 0 0.0 0
          9 9 0.0 0
          9 9 0.0 0
            9.9 0
            9.9 0
              .9 9
              .9 9
              .0 9
              .0 9
1 9,9 9 9,9 9 9.9 6 •
1 9,9 9 9,9 9 9.9 6 *
                .0 0 *
```

3. A repeat test is made by making the following test run:
   a. With the repeat key held depressed; repeat the figure "1" four times in each column.
   b. List "1" in all columns of the machine - and with the repeat key held depressed; repeat four times. Then repeat all other figures on the keyboard four times in the same way.
   c. Depress the total key. The total should be 44,444,444.24 on ten column machines.
4. Check the depression of the total key after slowly releasing the non add key.
5. Check the platen for correct spacing.
   a. Make sure the platen may be turned backwards except on the machines equipped with the non turn back platen feature.
   b. Check the pressure roll release lever for releasing the roll paper.
6. Check the machine for accumulation - including operation of the automatic one if the machine contains the minus balance feature.
   a. Perform the following test run three times: Minus balance machines .00* subtract .01 - and total .01-* eight column machines without the minus balance feature, subtract .01- and total 999,999.99*. Ten column machines without the minus balance feature, subtract .01 and total 99,999,999.99*.
   b. Perform the following test to check the automatic one:

.00-*	.00*
.00-●	.00●
.00-*	.00*
.01	.01-
.02-	.02
.02	.02-
.02-	.02
.02	.02-
.02-	.02
.02	.02-
.02-	.02
.02	.02-
.02-	.02
.02	.02-
.01●	.01-●
.01*	.01-*
.00*	.00-*

   c. Perform the following test to receive a carry and actuate the automatic one from each column, continue this procedure across the keyboard:

.00-*	.00●
.00-●	.00*
.00-*	
.09-	.09
.10	.10-
.01●	.01-●
.01*	.01-*
.99-	.00-*
1.00	.99
.01●	1.00-
.01*	.01-●
.00*	.01-*
9.99-	.00-*
10.00	9.99
.01●	10.00-
.01*	.01-●
.00*	.01-*
	.00-*

   d. Perform each of the following tests three times to receive a carry and actuate the automatic one:

```
                    .00●
                    .00*
66,666,666.66
66,666,666.66●
66,666,666.66*
                    .00●
                    .00*
10,000,000.00-
10,000,000.00
                    .00-●
                    .00-*
                    .01
                    .01*
                    .00*
11,111,111.11
 2,022,022.02-
 9,099,909.09*
                    .00*
88,888,888.88
 9,009,009.09-
79,797,979.79*
                    .00*
88,888,888.88
90,909,090.90-
 2,022,022.02-*
                    .00-*
```

SERIES P 400 AND P 600 MACHINES

1. Make a test run of the complete keyboard and all symbols. On Series P 600 machines, print columns 10, 11, 12, and 13 when the carriage is located in the stop position that permits printing the date and character columns. This test checks for wrong accumulation, type alignment, printing impression, damaged or worn type and listing and totaling capacities.

```
                                .00●  A
                                .00✲  A
                                .00●  B
                                .00✲  B
DEC 99 BAL   9,999,999.99
NOV 88 CR    8,888,888.88
OCT 77 J/E   7,777,777.77
SEP 66 C/M   6,666,666.66
AUG 66 C/M   5,555,555.55
JUL 55 CSH   4,444,444.44
JUN 55 CSH   3,333,333.33
MAY 44 FRT   2,222,222.22
APR 33 EXP   1,111,111.11
MAR 22 DIS   9,999,999.95●  A
FEB 22 DIS   9,999,999.95●  B
JAN 11 C/D             .05#
                       .05
                       .00✲  A
                       .00✲  B
                       .01-
                       .01 CR A
                       .01 CR A
                       .01 CR B
                       .01 CR B
```

2. Check the functioning of the repeat key by making the following test run:
   a. With the repeat key held depressed, repeat the figure "1" four times in each column.
   b. Index "1" in all columns of the machine. With the repeat key held depressed, repeat four times. Repeat all other rows of keys on the keyboard four times in the same manner.
   c. Depress the total key. The total should be 4,444,444.24.
3. Check repeating of subtract items.
   a. Depress the repeat key and minus bar simultaneously when amount keys are indexed on the keyboard. Release the minus bar after the first operation.
4. Check the machine to "handle break".
   a. The machine should "Handle break" when amount keys and total keys are depressed together and when total keys are held depressed.
   b. When the register selector normalizing key in position 7-0 is released, the register selector lever should not change position during a "handle break".
5. Check the correct functioning of the register selector lever when the key in position 7-0 is released by performing the following test four times.

```
.00✲  A
.00✲  B
.01-  A
.01   B
.01CR A
.01●  B
.01CR A
.01●  B
.01CR A
.01●  B
.01CR A
.01✲  B
```

6. Check for shadow print by performing the following test:

```
                .00*  A
                .00*  B
      9,900,000.00
      9,900,000.00
        990,000.00
        990,000.00
         99,000.00
         99,000.00
          9,900.00
          9,900.00
            990.00
            990.00
             99.00
             99.00
              9.90
              9.90
               .99
               .99
               .09
               .09
  1,999,999.96*  A
  1,999,999.96*  B
```

7. Check the automatic one by performing the following test:

```
.00*  A          .00*  A
.00*  B          .00*  B
.01-             .01
.02              .02-
.02-             .02
.02              .02-
.02-             .02
.02              .02-
.02-             .02
.02              .02-
.02-             .02
.02              .02-
.02-             .02
.01 CR A         .01●  A
.01 CR A         .01*  A
.00 CR A         .00*  A
.01 CR B         .01●  B
.01 CR B         .01*  B
.00 CR B         .00*  B
```

8. Check for releasing an unwanted carry by performing the following test. Cause the machine to "handle break" four times (using the total key and amount key) after listing each subtract item.

```
                .00*  A
                .00*  B
  1,111,111.11
                .02-
                .10-
              1.00-
             10.00-
            100.00-
          1,000.00-
         10,000.00-
        100,000.00-
      1,000,000.00-
               .01 CR A
               .01 CR A
               .01 CR B
               .01 CR B
               .00 CR A
               .00 CR B
               .01
               .01●  A
               .01●  B
               .01*  A
               .01*  B
               .00*  A
               .00*  B
```

9. Check for receiving a carry and actuating the automatic one from each column by performing the following tests:

.00*		A
.00*		B
.09		A
.10-		A
.01	CR	A
.00	CR	A
.90		A
1.00-		A
.10	CR	A
.00	CR	A
9.00		A
10.00-		A
1.00	CR	A
.00	CR	A
90.00		A
100.00-		A
10.00	CR	A
.00	CR	A
900.00		A
1,000.00-		A
100.00	CR	A
.00	CR	A
9,000.00		A
10,000.00-		A
1,000.00	CR	A
.00	CR	A
90,000.00		A
100,000.00-		A
10,000.00	CR	A
.00	CR	A
900,000.00		A
1,000,000.00-		A
100,000.00	CR	A
.00	CR	A
.01		A
.01*		A
.00*		A

10. For Series P 600 machines, operate the machine according to the various applications for which it is used and check the following carriage controlled functions to be correct:
   a. Stop positions
   b. Machine operations
   c. Printing control selections.
   d. Tabulation and carriage return.

REMOVAL AND REPLACEMENT PROCEDURES

CASE - SERIES P 100, P 200, P 300, P 2200 MACHINES

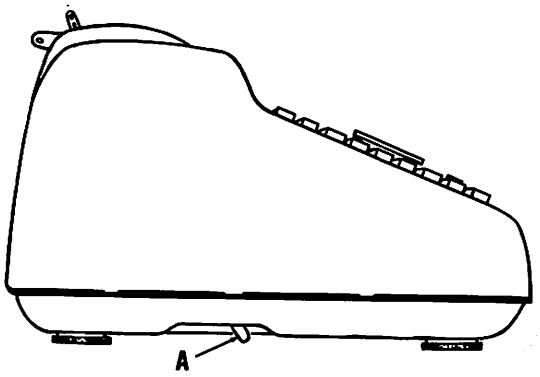


Fig. IX-1

A. Removal
   1. Roll paper
   2. Push the latching arms A rearward (which extend through the base on both sides near the center of the machine) to unlatch the case.
   3. Raise the front of case to approximately a 045° angle, then with a rearward and upward movement, remove the case.

B. Replacement
   1. Install all parts removed by reversing the above procedure.

CASE - SERIES P 1200, P 1300, P 1400 MACHINES

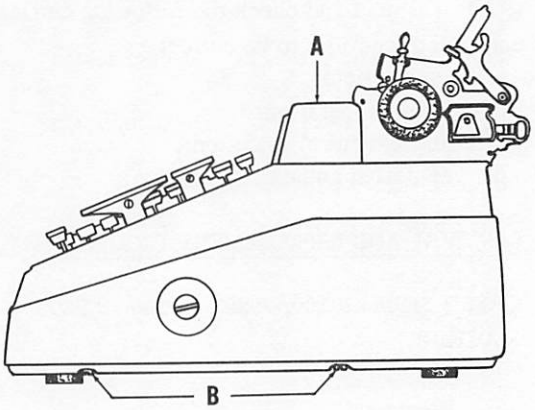


Fig. IX-2

A. Removal
1. Roll paper
2. Ribbon cover A by pulling same straight upward.
3. Carriage
4. Hammerhead cover.
5. Four self tapping screws B (two on each side of machine)
6. Lift case straight upward.

B. Replacement
1. Install all parts removed by reversing the above procedure.

BASE - SERIES P 100, P 200, P 300 MACHINES

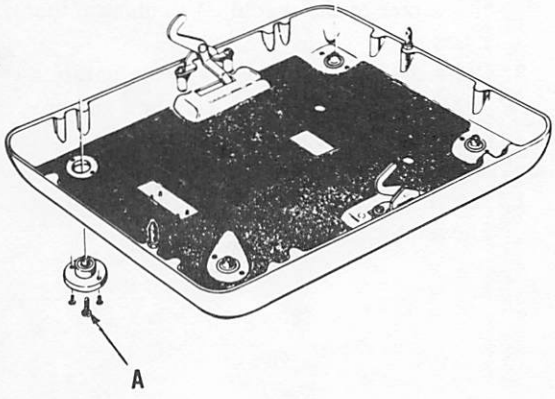


Fig. IX-3

A. Removal
1. Case
2. Invert the machine and remove four screws A from center of the four shock mount feet. Lift the base from machine.

B. Replacement
1. Install all parts removed by reversing the above procedure.

BASE - SERIES P 2200 MACHINES

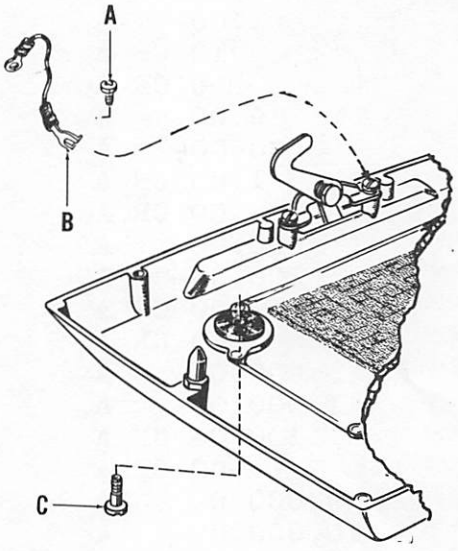


Fig. IX-4

A. Removal
1. Case
2. Disconnect wire B by loosening screw A.
3. Invert the machine and remove four screws C from center of the four shock mount feet, lift the base from machine.

B. Replacement
1. Install all parts removed by reversing the above procedure.

BASE - SERIES P 1200, P 1300, P 1400 MACHINES

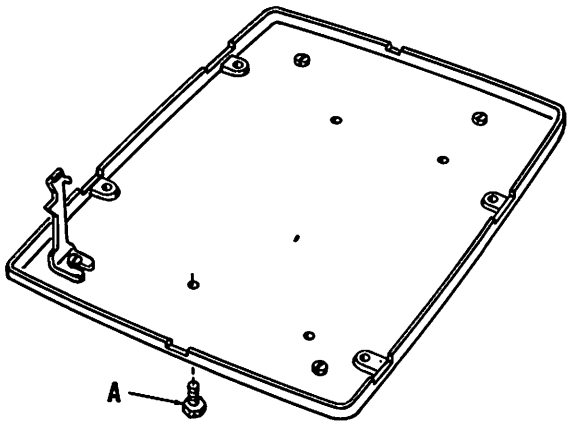


Fig. IX-5

A. Removal
1. Case
2. Invert the machine and remove four screws A, lift the base from the machine.

B. Replacement
1. Install all parts removed by reversing the above procedure.

CASE - SERIES P 600 MACHINES

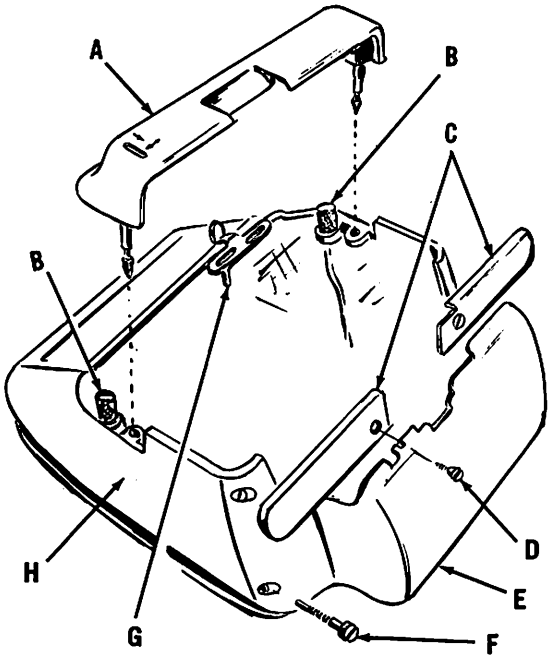


Fig. IX-6

A. Removal
1. Remove ribbon cover A by lifting it upward.
2. Remove lever G.
3. Remove four screws F and rear case section E.
4. Remove two screws D and tabulating spring covers C.
5. Remove two knurled nuts B.
6. Raise the forward end of front case section H and slide the front case section from under the carriage.

B. Replacement
1. Replace all parts removed by reversing the above procedure.

BASE - SERIES P 400, P 600 MACHINES

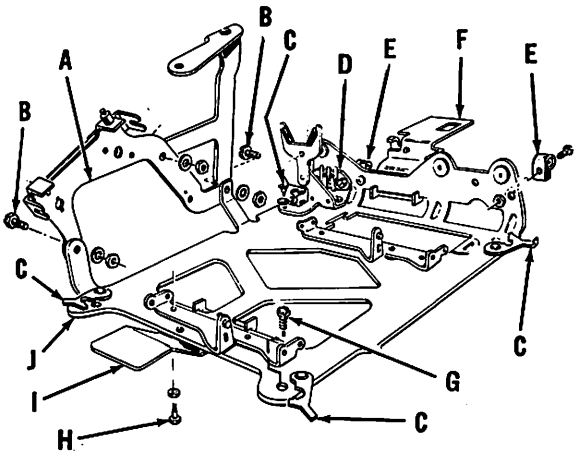


Fig. IX-7

A. Removal
1. Remove the case.
2. Loosen four screws G.
3. Swing the four retaining hooks C from under the head of the four screws G.
4. Grasp the machine by the lifting plates F and I and lift the machine from the base.

B. Replacement
1. Replace all parts removed by reversing the above procedure.

SUB-BASE - SERIES P 400, P 600 MACHINES

A. Removal
1. Remove the case
2. Remove the base
3. Disconnect the three wires from the line cord receptacle D, Fig. IX-7.
4. Break the connection in the wire leading from the handle switch to the motor and remove the two handle switch wires from brackets E, Fig. IX-7.
5. Remove two screws B, Fig. IX-7 and bracket A, Fig. IX-7.
6. Turn the machine over and remove four screws G, Fig. IX-7 and sub-base J. Fig. IX-7.

B. Replacement
1. Replace all parts removed by reversing the above procedure.

NOTE: Turn the machine right side up before tightening the two screws B, Fig. IX-6.

CARRIAGE 3 7/8" STYLE NA-2

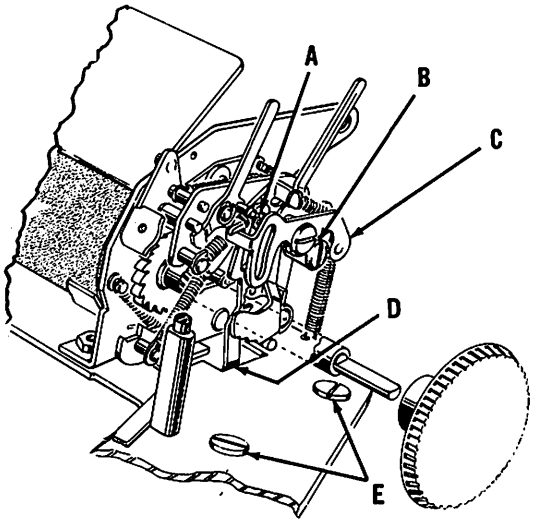


Fig. IX-8

A. Removal
1. Remove the machine case
2. Remove screw B and part C
3. Remove clip A and release link D
4. Remove three screws E securing the carriage bottom plate to the hammerhead.
5. Remove the carriage by lifting straight upward.

B. Replacement
1. Replace all parts removed by reversing the above procedure.

C. Check for correct carriage spacing as outlined in tests No. 6 thru 9, page 7, Section II.

CARRIAGE 12 1/4 STYLE B - SERIES P 400 MACHINES

A. Removal
1. Remove the ribbon cover.
2. Remove the screw and eccentric (from rear of carriage) that provide the adjustment for support to the rear of the carriage.
3. Remove the four screws that hold the carriage to the hammerhead.

B. Replacement
1. Replace all parts removed by reversing the above procedure. When installing the four screws holding the carriage to the hammerhead, installation should be made in the following manner:
   a. Loosely install a screw in the right rear (pilot) hole.
   b. Install and tighten the remaining three screws in a counterclockwise sequence.
   c. Tighten the first screw installed.
2. Adjust for the following condition:
   The eccentric that provides support to the rear of the carriage should be positioned to provide maximum support to the center of the carriage bottom plate.

CARRIAGE 15" STYLE C - SERIES P 600 MACHINES

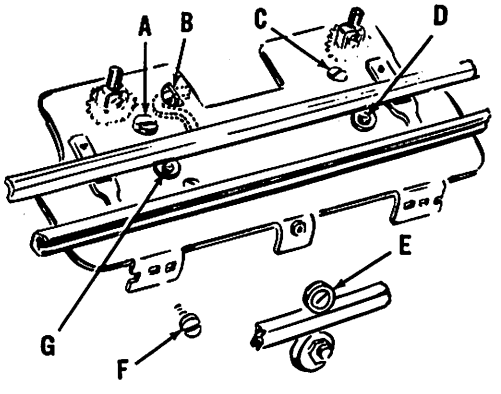


Fig. IX-9

A. Removal
1. Remove the ribbon cover.
2. Remove the rear section of the case and the two tabulating spring covers.
3. Remove roll E for the third rail.
4. Remove four screws F holding the M.R.C. Unit to the carriage.
5. Remove screws C and D in the left side of the carriage bottom plate.

NOTE: Support the carriage to prevent the carriage from falling.

6. Remove screws A and G in the right side of the carriage bottom plate.
7. Lift the carriage from the machine.

NOTE: If the machine is equipped with a form pressure bail, remove the latter before operating the machine with the carriage off.

B. Replacement
1. Replace all parts removed by reversing the above procedure.
2. Check the ribbon feed bellcrank and the slide on the carriage bottom plate to be engaged by the hammer latch section.
3. Check connection B in the carriage opening interlock linkage to be properly engaged.
4. Check the stud in the slide on the right end of the carriage bottom plate to engage the vertical space bar linkage.
5. Check the following tests and adjustments for being correct:
   a. Adjustment 1, Page 8, Section VII.
   b. Adjustments 1 thru 9, Pages 16, 17, Section VII.
   c. Adjustments 1 thru 3, Pages 20, 21, Section VII.
   d. Adjustments 1 thru 3, Page 24, Section VII.
   e. Adjustments 1 thru 14, Pages 29, 30, Section VII.
   f. Adjustment 1, Page 32, Section VII.
   g. Adjustments 1 thru 4, Page 35, Section VII.

PLATEN - SERIES P 600 MACHINES

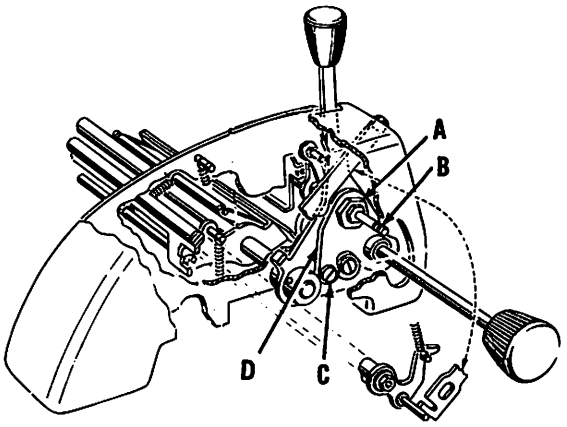


Fig. IX-10

A. Removal
1. Remove the variable line spacer assembly from the platen shaft.
2. Remove the left platen twirler.
3. Remove the carriage end covers.
4. Remove the platen spacing gear assembly from right end of the platen shaft.
5. Remove the linkage connected to the left end of the form aligning table.
6. Open the carriage and the journal pressure roll.
7. Remove screw C.
8. Remove screw B and Eccentric A.
9. Remove left platen end plate D.
10. Raise the left end of the platen and pull the platen through the opening in the left carriage side frame.

B. Replacement
1. Replace all parts removed by reversing the above procedure.
2. Adjust for the following condition:
   Turn eccentric A to raise or lower the platen for printing which corresponds to the printing on the right end of the platen. Tighten screw B.

KEYBOARD - SERIES P 100

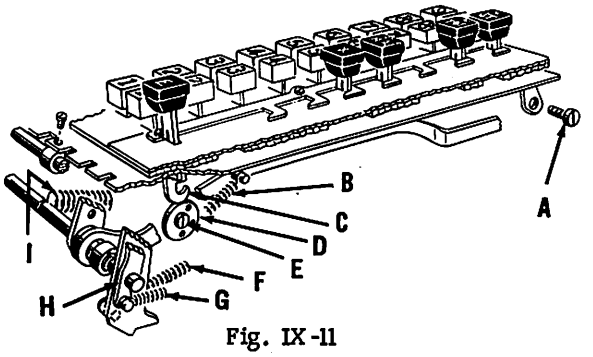


Fig. IX-11

A. Removal
1. Remove machine case and base.
2. Remove the carriage.
3. Remove the touch bar.
4. Remove screw A and its corresponding screw on the left side.
5. Loosen screw E then turn eccentric washer D clockwise slightly.
6. Unhook springs B, F, G and I.
7. Remove retainer H.
8. Raise the rear of keyboard to free hooks C.
9. Remove the keyboard by holding its rearmost portion upward and then pulling the keyboard forward.

B. Replacement
1. Install all parts removed by reversing the above procedure.
2. Check for correct cipher stop adjustments as outlined on page 10, Section II.

KEYBOARD - SERIES P 200, P 2200 MACHINES

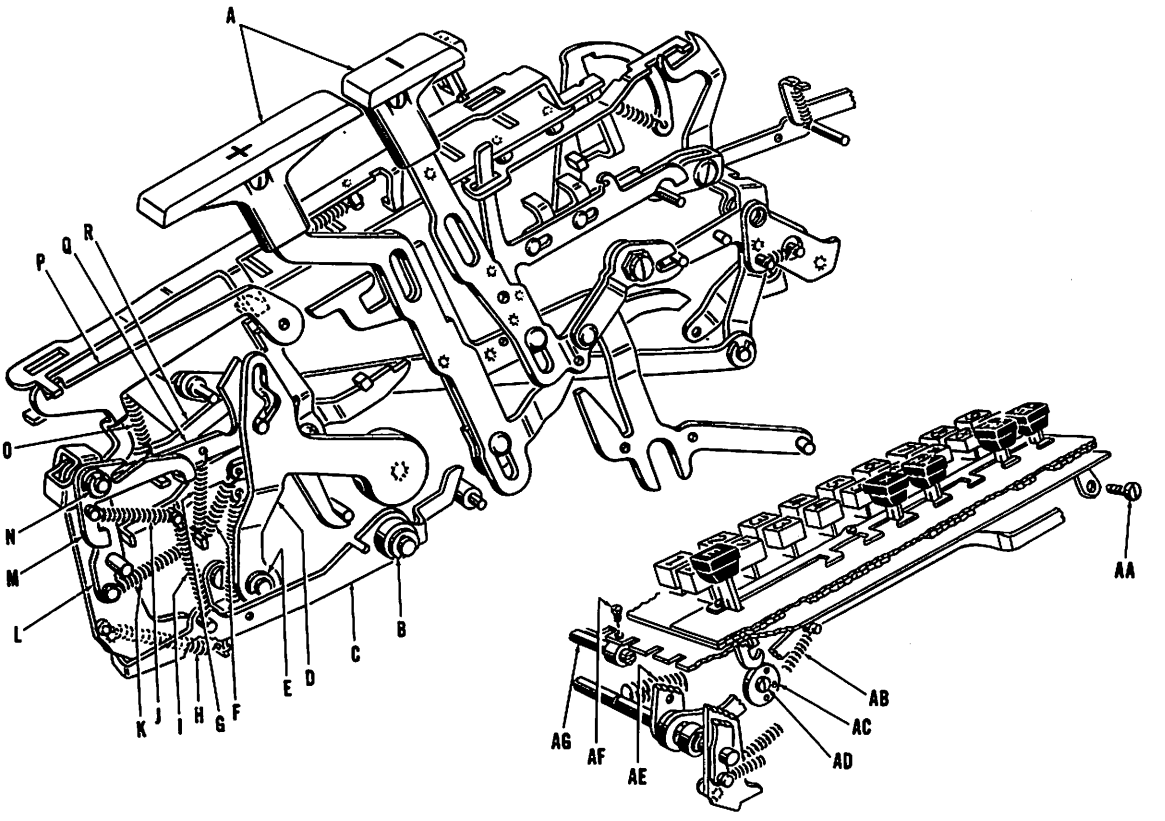


Fig. IX-12

A. Removal
1. Remove the machine case and base.
2. Remove the carriage.
3. Remove touch bars A.
4. Unhook top of spring I.
5. Remove clip B and interlock C.
6. Remove clip E and counter balance arm D.
7. Unhook springs F, G, H, J, K
8. Remove clip N and latch M.
9. Remove retainer L.
10. Unhook spring AE.
11. Loosen screw AF.
12. Unhook spring O.
13. Move shaft AG to the left approximately 1/2"
14. Remove timing arm Q, counter balance arm P, and latch R as a unit.
15. Unhook spring AB.
16. Loosen screw AD then turn eccentric washer AC clockwise slightly.
17. Remove screw AA also a screw similar to AA located in the left rear portion of the keyboard.
18. Remove the keyboard by first raising the rearmost portion of the keyboard then pulling the latter forward.

B. Replacement
1. Install all parts removed by reversing the above procedure.

KEYSTEM

A. Removal
1. Remove the machine case and base.
2. Remove total strip A, Plate 101, Keyboard Parts Catalog.
3. Remove shafts U and V, Plate 101, also shaft K, Plate 113.
4. Remove retainer CT, Plate 100.
5. Remove screw AZ, Plate 103.
6. Remove key release bail BS, Plate 101, by first moving shaft BO, Plate 101, slightly to the right until clear of left end of the bail then moving the shaft to the left until clear of the bail.
7. Unhook the springs from the rear of the locking strip and index strip in the column in which the keystem is to be removed.
8. Insert a follow up shaft from the left end and move shaft BO, Plate 101, to the right as far as the column in which the keystem is to be removed.
9. Remove cipher stop M, Plate 101 from the front end of the index strip in the column in which the keystem is to be removed.
10. Remove the rocker arm J, Plate 101, from the front end of the locking strip in the column in which the keystem is to be removed.
11. Remove index strip X, Plate 101 and the locking strip BD, Plate 101, by pulling the latter forward in the column in which the keystem is to be removed.
12. Unhook the forward end of spring N, Plate 102, in the column in which the keystem is to be removed.
13. Remove the desired keystem by pulling the latter upward.

B. Replacement
1. Install all parts removed by reversing the above procedure.

ACCUMULATOR SECTION - SERIES P 100 MACHINE

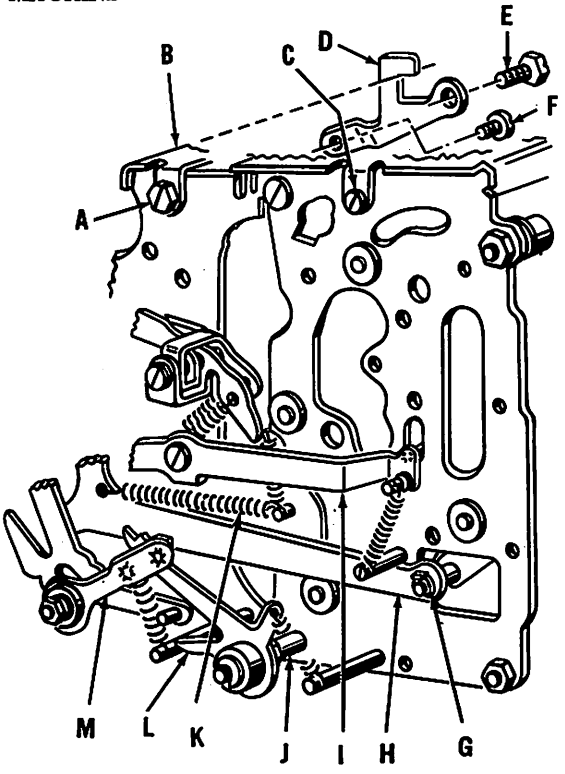


Fig. IX-13

A. Removal
1. Remove the machine case, carriage, base, and sub-base.
2. Remove the motor and drive (Figs. IX-75, IX-76).
3. Remove hammerhead B after first removing screws A, E, and F, retainer D, screw C, and its corresponding screw on the left side.
4. Remove arms I and M.
5. Remove latch L and screw stud J.
6. Unhook spring K.
7. Remove clip G.
8. Release arm H.
9. Remove the accumulator section.

B. Replacement
1. Install all parts removed by reversing the above procedure.
2. Check the following tests and adjustments for being correct.
   a. Adjustments 1, 2, Page 18, Section II.
   b. Adjustments 1 thru 5, Page 29, Section II.

ACCUMULATOR SECTION - CLASS 10 THREE REGISTER MACHINE

NOTE: All references will be found in Section V, Series P Instruction Book, Form 3784.

A. Removal
1. Hammerhead Section
   a. Remove lever AD, Fig. V-5.
   b. Remove rotary numbering device
   c. Remove two rear screws retaining the hammerhead to the accumulator section.
   d. Remove the support for left front of hammerhead which is held by left rear keyboard retaining screw.
   e. Move the shaft which holds arm F, Fig. V-20 to the left and leave the arm in the machine while removing the hammerhead.
   f. Index all nines on the keyboard and pull handle to raise all the sectors to nine position, remove the hammerhead by raising the latter straight up.
2. Accumulator Section
   a. Disconnect upper register meshing controls.
   b. Remove stud O, Fig. V-20.
   c. Disconnect register shift arm E, Fig. V-24.
   d. Remove arm J, Fig. V-10.
   e. Remove the screw retaining drive trip latch.
   f. Remove the clip holding registers B and C accumulator control arm and disconnect arm from meshing assembly.
   g. Disconnect "List Key" interlock I, Fig. V-10.
   h. Remove screw retaining left side of accumulator section to the cross brace.
   i. Unhook necessary springs and pull accumulator section to the rear.

B. Replacement
1. Replace all parts removed by reversing the above procedure.
2. Check adjustments 1 thru 8, Pages 17, 18, 19, Section V.

REGISTERS "B" AND "C" - CLASS 10 THREE REGISTER MACHINE

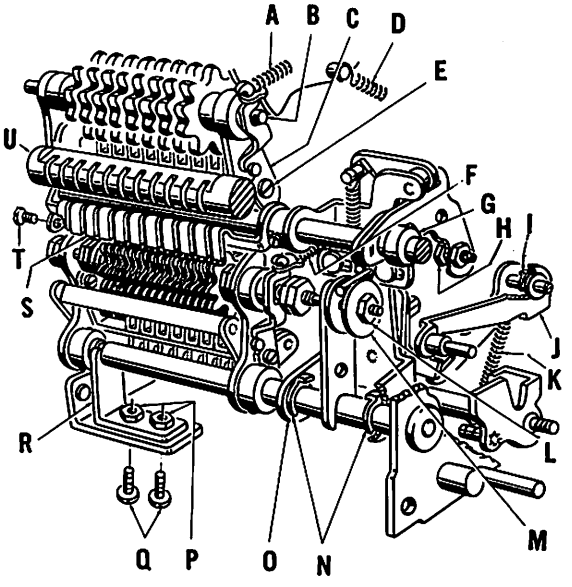


Fig. IX-14

A. Removal
1. Remove the accumulator section from the machine.
2. Remove remaining screws and nuts holding the accumulator right sideframe to the accumulator section.
3. Remove clip I.
4. Remove nut H.

5. Unhook spring K.
6. Remove arm J.
7. Remove accumulator right sideframe.
8. Remove aligning shaft U.
9. Remove clips N.
10. Remove nut L.
11. Remove set collar G.
12. Remove shift bracket O and yoke M.
13. Remove screw T.
14. Unhook springs A and D.
15. Trip off all carries in the upper register.
16. Remove screw E and retainer C.
17. Slide pinion shaft B to the right enough to clear left side of frame.
18. Remove upper register section by moving it forward and to the right.
19. Remove spring F.
20. Remove nuts P and screws Q.
21. Remove bracket R.
22. Trip off carries in the lower register.
23. Remove lower register section by moving forward and to the right.

B. Replacement

1. Replace all parts removed by reversing the above procedure.
2. After re-assembly the lower registers and associated parts in the accumulator and before re-assembling the accumulator section to the machine, it is recommended that tests and adjustments 3 thru 8, pages 18, 19 Section V be made.

NOTE: The tests and adjustments referred to above are written to apply to an accumulator already assembled to the machine, however, they may readily be made while the accumulator is off the machine by manually indexing the mechanisms for the test purposes, and making the necessary adjustments at that time.

ADDING PINIONS, REGISTERS "B" AND "C" - CLASS 10 THREE REGISTER MACHINES

A. Removal

1. With the lower register section removed from the accumulator section; remove bail E.
2. Remove limit nuts H and A.
3. Remove screw C and retainer B.
4. Remove screw G.
5. Remove pin F.

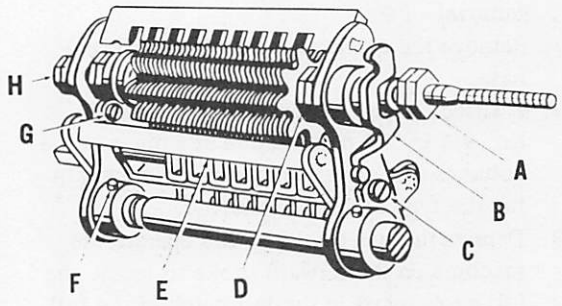


Fig. IX-15

6. Remove register section left sideframe.
7. Remove register pinions and shaft.
8. Remove nuts D.
9. Remove pinions from pinion shaft.

B. Replacement

1. After replacing pinions on shaft, turn inside nut D finger tight and lock with outside nut D.
2. Replace all parts removed by reversing the above procedure.
3. After re-assembling the register pinion section, it is necessary to make tests 1 and 2, pages 16, 17, 18, Section V.

NOTE: The tests adjustments referred to above are written to apply to the pinion section when assembled to the machine, however, the tests may readily be made while the register section is out of the machine by manually indexing the mechanism for test purposes and making necessary adjustments at this time.

TYPE BAR - SERIES P 400 AND P 600 MACHINES

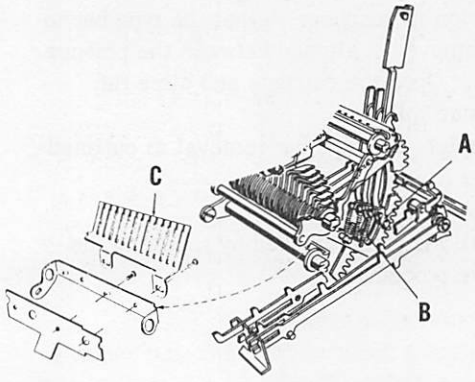


Fig. IX-16

A. Removal - P400
1. Remove the carriage, case, base and sub-base.
2. Position the register selector lever (O.C.L. No. 60) in "B" position and add nines in the columns to the right of the column containing the type bar to be removed.
3. Depress the sub-total key and operate the machine on the forward stroke to locate the full stroke pawl in the last notch of the full stroke segment.
4. Lay the machine on its left side.
5. Remove guide C.
6. Unhook spring B.
7. Disengage clip A from the stud in the type bar, letting the clip lay on the adding sector.
8. Remove the desired type bar by pulling it upward.

NOTE: When pulling the type bar upward, it may be necessary to spread the hammer latches to permit passage of the two studs in the lowermost portion of the type bar.

B. Replacement - P 400
1. Install all parts removed by reversing the above procedure.

C. Removal - P 600
1. Remove the case, base and sub-base.
2. Disconnect the carriage opening interlock link between keyboard columns 2 and 3 from the key restoring rack assembly at the front of the keyboard.
3. Remove the form pressure bail (if the machine is so equipped) from the printing head by turning the four flat-sided studs 1/4 turn.
4. Remove the form aligning table.
5. Position the carriage so that the type bar to be removed is aligned between the pressure rolls. Open the carriage and close the pressure rolls.
6. Complete the type bar removal as outlined under A above.

D. Replacement - P 600
1. Install all parts removed by reversing the above procedure.

MOTOR BAR CONTROL PANEL - CLASS 10 THREE REGISTER MACHINES

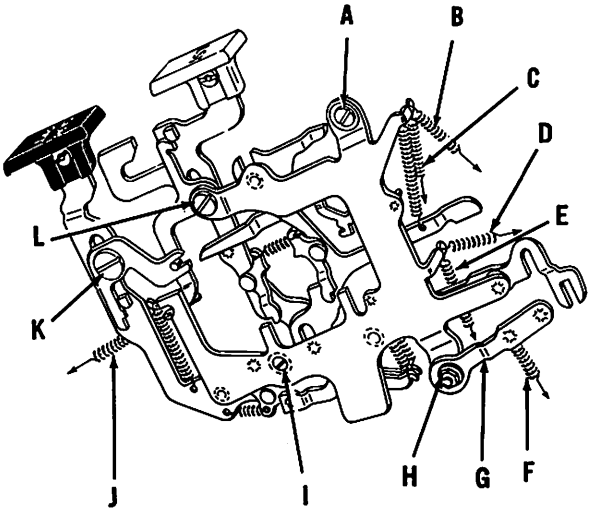


Fig. IX-17

A. Removal
1. Unhook springs B, C, D, E, F and J.
2. Remove screws A, I, K, L and nut H.
3. Remove arm G.
4. Remove motor bar control panel.

B. Replacement
1. Install all parts removed by reversing the above procedure.

CONTROL PANEL - SERIES P 400 AND SERIES P 600 MACHINES

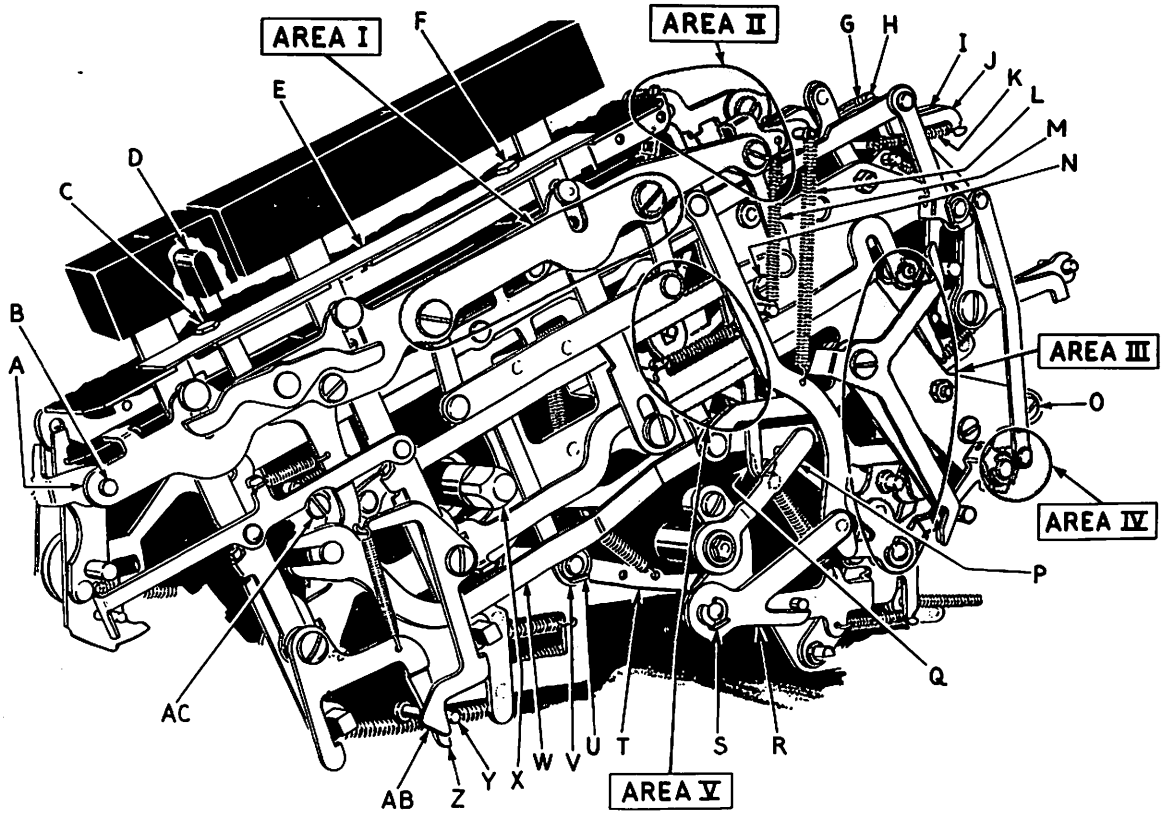


Fig. IX-18

NOTE: When applying this procedure, care must be exercised that no parts are forced into or out of position, and that excessive pressure is not applied to the panel while replacing it.

A. Removal - P 400
1. Place lever D in "AB" position.
2. Loosen screws C and F.
3. Remove plate E.
4. Unhook springs K from slides I and J.
5. Unhook springs L and M.
6. Remove clip S and arm R.
7. Remove clip U and disconnect link V from interlock T.
8. Remove screws N and O.
9. Loosen screw AC sufficiently to permit removal of the panel.
10. Remove the panel by applying an outward and slightly upward movement to the panel.

B. Replacement - P 400
1. Place lever D in "AB" position.
2. Position bell cranks AD (Area I) as illustrated.

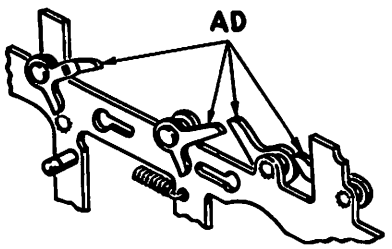


Fig. IX-18 AREA I

Note: Care must be taken that bell cranks AD do not get out of their correct position during the following procedure.

3. Place handle shaft X through the opening in the control panel as illustrated.
4. Position arm Q behind arm P; this may be accomplished by tilting the rear of the control panel slightly upward and the upper portion of the control panel outward.
5. Position interlocks Z and AB to the front of stud Y.
6. Insert shaft B into the hole in the foremost portion of plate A.
7. Position stud AE (Area V) into the slot of vertical arm AF, and roll AH (Area V) into the slot of the arm AG, as illustrated.

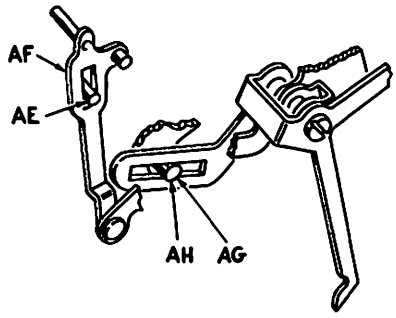


Fig. IX-18 AREA V

Note: A slight inward pressure should be applied to the control panel with the left hand, while proceeding with steps 8 through 12.

8. Raise the rearmost portions of slides I and J above arms G and H.
9. Place arms G and H between slides I and J.
10. Position the rearmost portion of arm W (Area IV) in front of the lip on bail AI, as illustrated.
11. a. Position lip AV (Area II) to the rear of tail AT when replacing the control panel on Style P 401 machines, as illustrated.

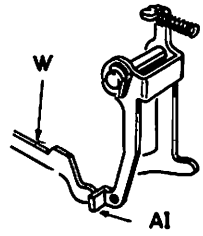


Fig. IX-18 AREA IV

b. Position lip AV (Area II) between tails AT and AU when replacing the control panel on Style P 402 machines, as illustrated.

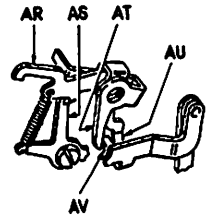


Fig. IX-18 AREA II

12. Position stud AK (Area III) to the rear of arm AJ, stud AL (Area III) to the rear of finger AM, stud AN (Area III) to the rear of finger AO, and stud AP (Area III) to the rear of finger AQ, as illustrated.

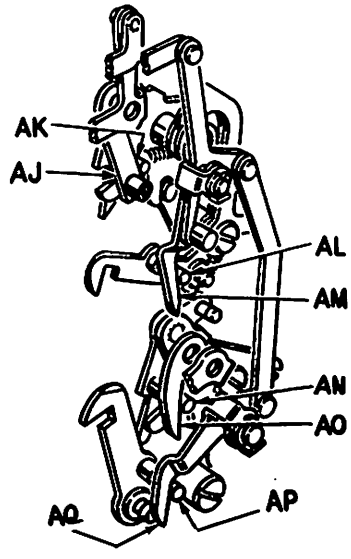


Fig. IX-18 AREA III

Note: Before proceeding with the following steps, it may be necessary to recheck the position of the parts as outlined in steps 5, 10, 11, and 12 to assure that the panel is resting against and in line with the locations for screws N, O, and AC.

13. Replace screws N and O but do not tighten.
14. Tighten screw AC.
15. Tighten screws N and O.
16. Replace arm R and clip S.
17. Connect link V to interlock T and replace clip U.
18. Connect springs K to slides I and J.
19. Connect springs L and M as illustrated.
20. Replace plate E and tighten screws C and F.
    Note: See illustration of Area II for parts referred to in step 21 below.
21. Check step of latch AS for being located under the lip on interlock AR.

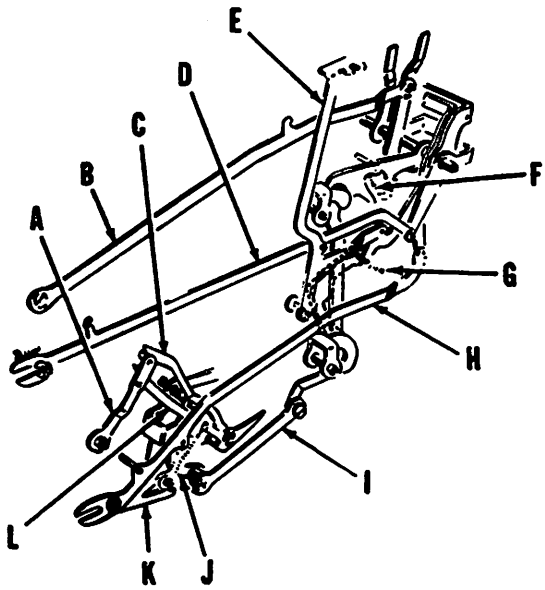


Fig. IX-19

C. Removal - P 600
1. Remove the carriage (Page 14) and base (Page 13).
2. Lay the machine on its left side.
3. Remove the two screws and the handle switch.
4. Remove arm E.
5. Remove carriage controlled red ribbon lift indexing link H.
6. Remove delayed drive trip latch C.
7. Disconnect the rear end of carriage controlled subtract link D.
8. Remove link B.
9. Remove drive trip arm A.
10. Remove arm K.
11. Remove drive trip arm latch L.
12. Disconnect springs F and G.
13. Disconnect link I from arm J.
14. Continue removing the control panel as outlined under A above.

D. Replacement - P 600
1. Replace the control panel and parts in reverse order.

CONTROL PANEL - SERIES P 600 WITH AUTOMATIC FEATURES

Removal

1. Machine case, carriage and base.

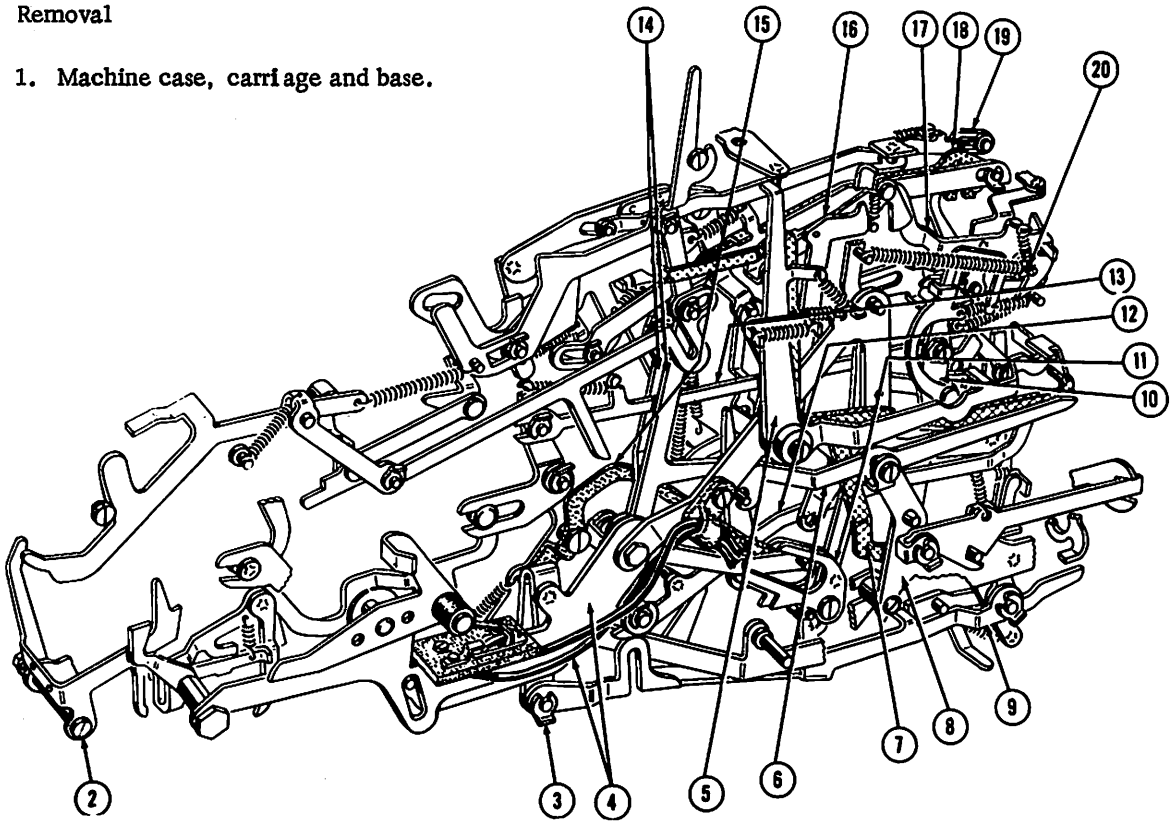


FIGURE IX-19 A

CIRCLED NUMBERS (2 THROUGH 20) LOCATE STEPS OUTLINED IN THE FOLLOWING TEXT.

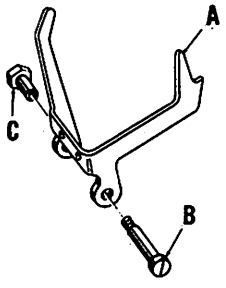


FIGURE IX-20

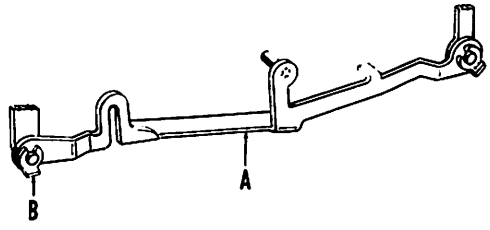


FIGURE IX-21

(2) Screw B, nut C and bail A.

(3) Clip B holding link A to the motor bar bell crank.

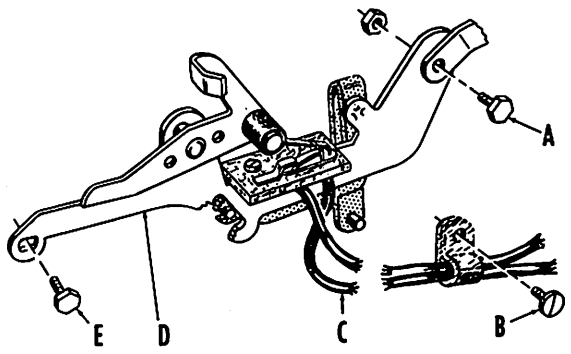


Fig. IX-22

(4) Screws A, B, and E, handle switch bracket D and lead wires C.

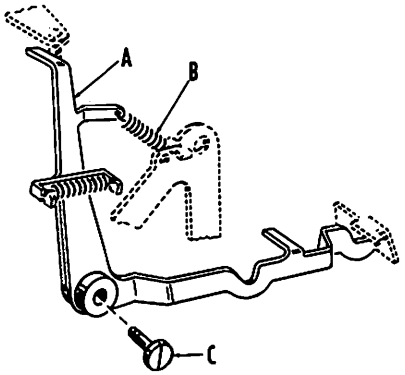


Fig. IX-23

(5) Unhook spring B, then remove screw C and lever A.

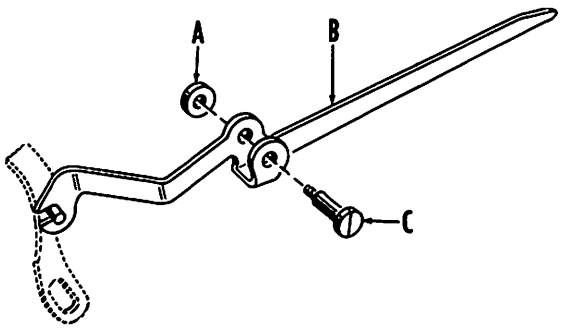


Fig. IX-24

(6) Screw C and lever B.
Note: Space washer A behind lever B.

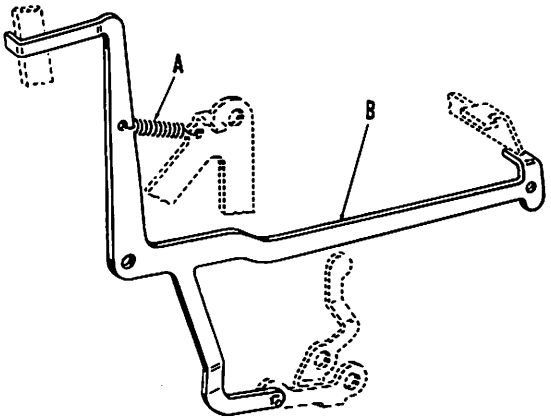


Fig. IX-25

(7) Unhook spring A, then remove lever B.

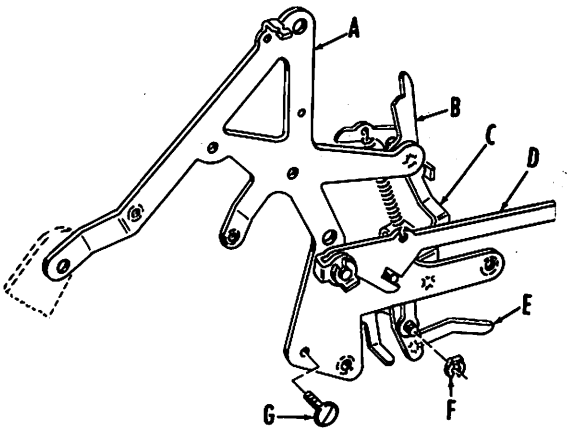


Fig. IX-26

(8) Screw G and clip F, then parts A, B, C, D, and E as a unit.

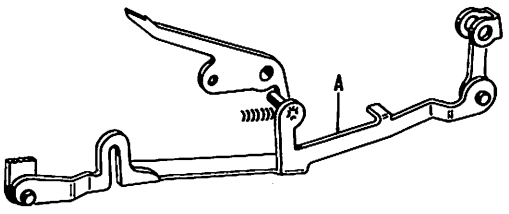


Fig. IX-27

(9) Remove link A.

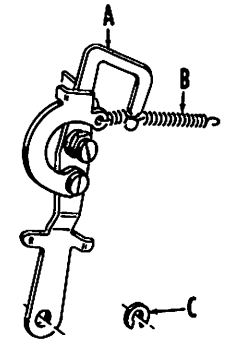


Fig. IX-28

(10) Unhook spring B, then remove clip C and skip indexing arm A.

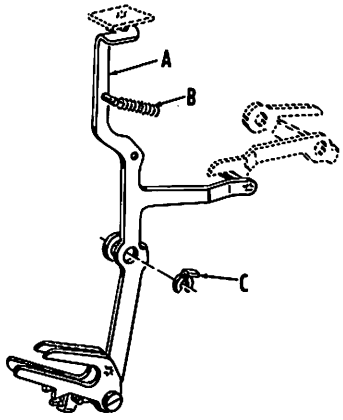


Fig. IX-29

(11) Unhook spring B, then remove clip C and lever A.

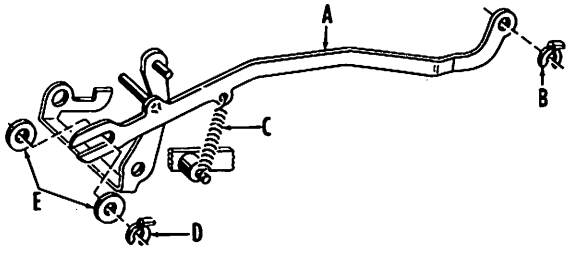


Fig. IX-30

(12) Clips B and D, spring C, spacers E and red ribbon indexing arm A.

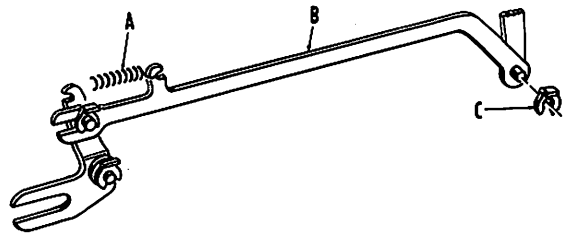


Fig. IX-31

(13) Unhook spring B, then remove clip C and skip indexing arm A.

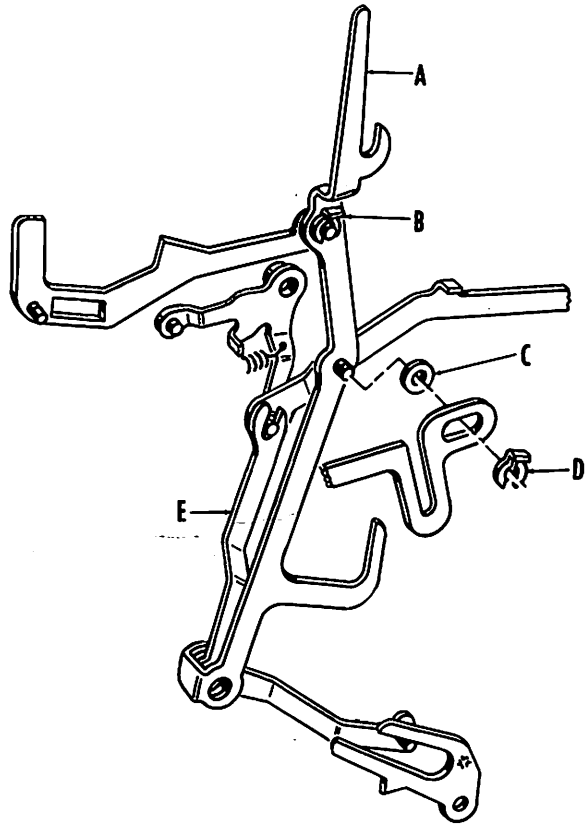


Fig. IX-32

(14) Clips B and D, and spacer C, then remove lever A and bellcrank E.

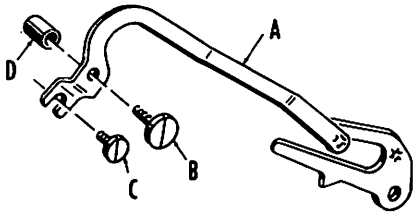


Fig. IX-33

(15) Loosen screw C, then remove screw B spacer D and arm A.

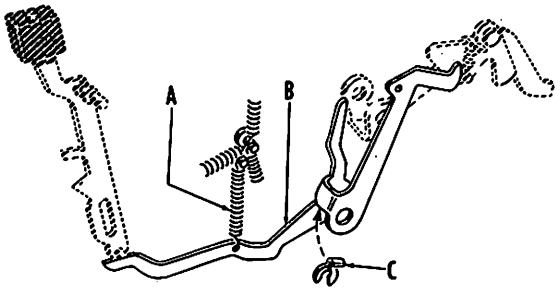


Fig. IX-34

(16) Unhook spring A, then remove clip C and arm B.

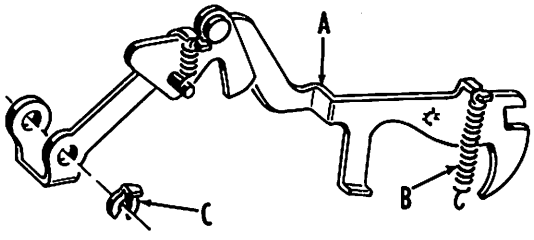


Fig. IX-35

(17) Unhook spring B, then remove clip C and arm A.

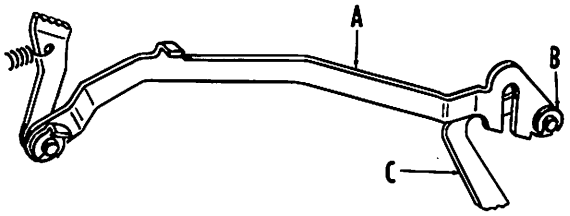


Fig. IX-36

(18) Clip B, and disconnect skip indexing linkage A from lever C.

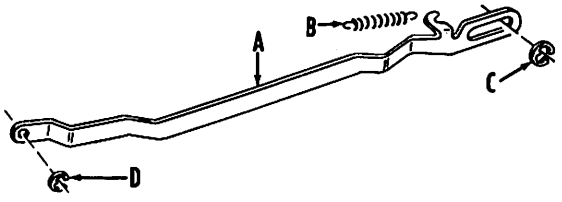


Fig. IX-37

(19) Unhook spring B, then remove clips C and D and automatic total indexing link A.

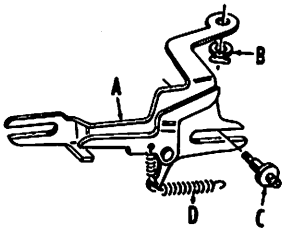


Fig. IX-38

(20) Unhook spring D, then remove clip B, screw stud C and slide A.

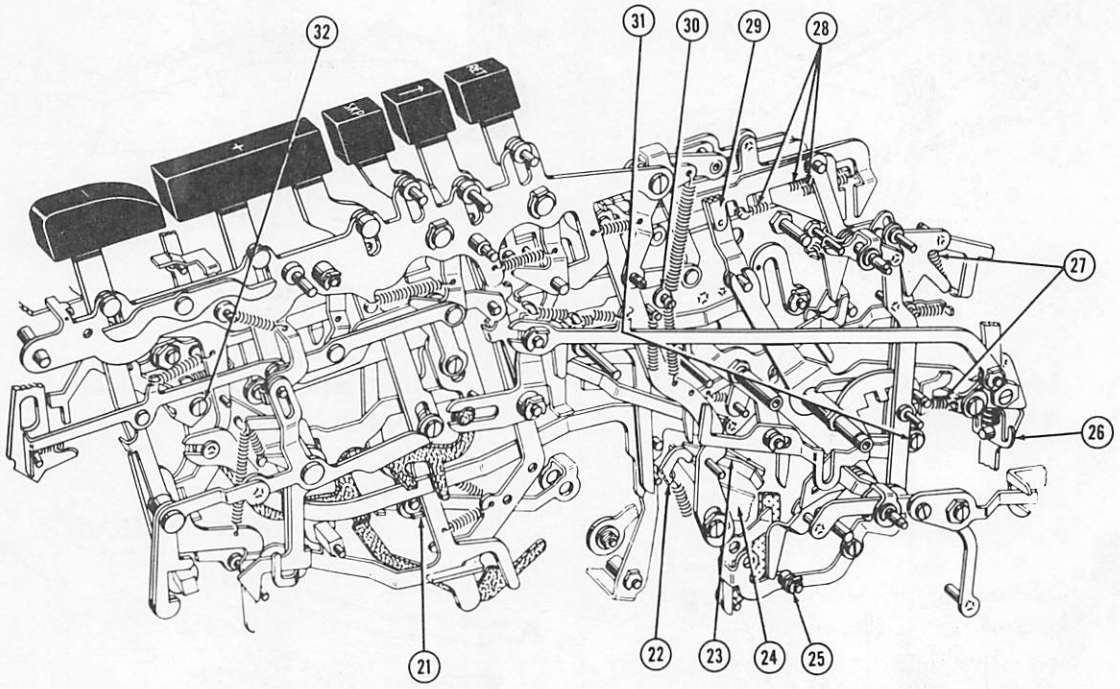


Fig. IX-39

CIRCLED NUMBERS (21 THROUGH 32) LOCATE STEPS OUTLINED IN THE FOLLOWING TEXT.

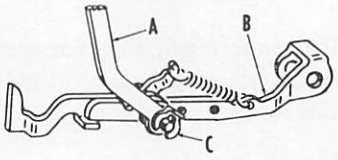


Fig. IX-40

(21) Clip C, and disconnect link A from interlock B.

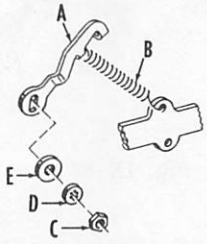


Fig. IX-41

(22) Unhook spring B, then remove nut C, lock washer D, washer E and arm A.

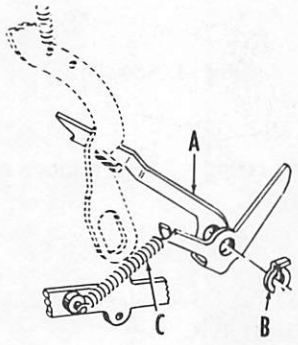


Fig. IX-42

(23) Unhook spring C, then remove clip B and latch A.

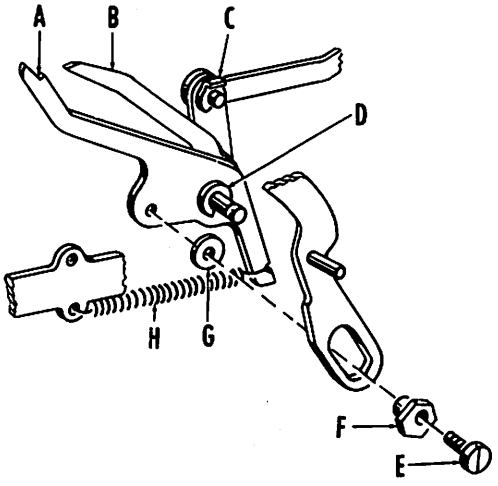


Fig. IX-43

(24) Unhook spring H. Mark the position of eccentric nut F. Remove the following; clips C and D, screw E, eccentric nut F, washer G, and latches A and B.

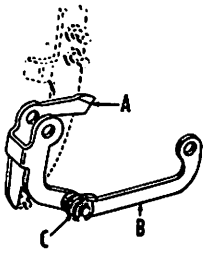


Fig. IX-44

(25) Clip C, and disconnect link B from bellcrank A.

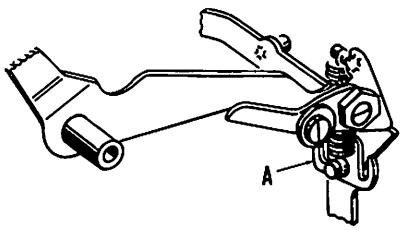


Fig. IX-45

(26) Spring assembly A.

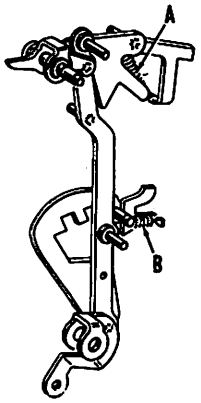
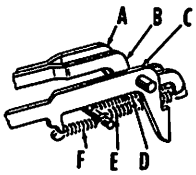


Fig. IX-46

(27) Unhook springs A and B.



(28) Unhook springs D, E, and F from slides A, B, and C respectively

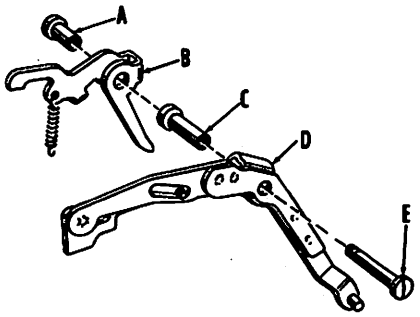


Fig. IX-47

(29) Screw E, spacer C and power arm D.

Note: After removing power arm D, screw E may be replaced to retain latch B and spacer A in position.

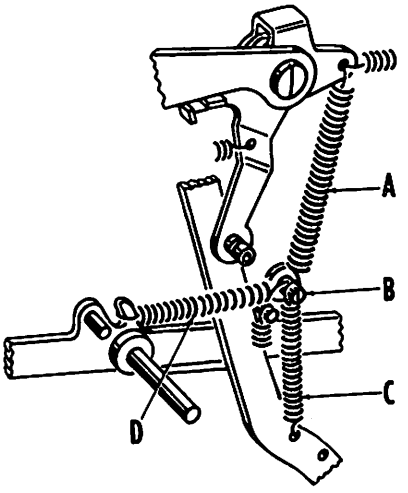


Fig. IX-48

(30) Unhook springs A, C, and D and remove spring anchor screw B.

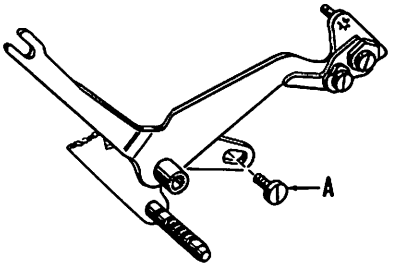


Fig. IX-49

(31) Remove screw A.

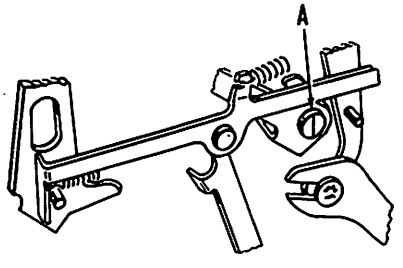


Fig. IX-50

(32) Loosen screw A sufficiently to permit removal of the panel.

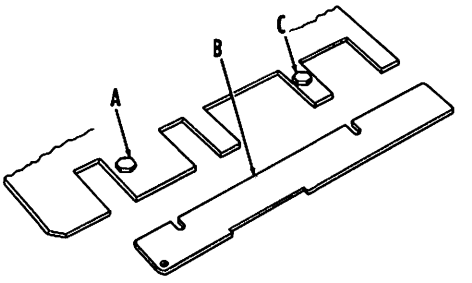


Fig. IX-51

(33) Loosen screws A and C and remove plate B.

(34) Carefully lay the machine on its left side and remove the panel by first moving the front end upward and then forward.

Replacement

(35) Carefully lay the machine on its left side and center the register selector lever between "A" and "B" positions.

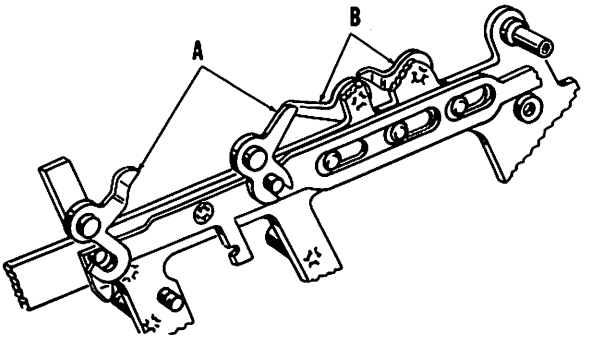


Fig. IX-52

(36) Bellcranks A and B must be positioned, and held positioned, as illustrated while assembling panel to machine.

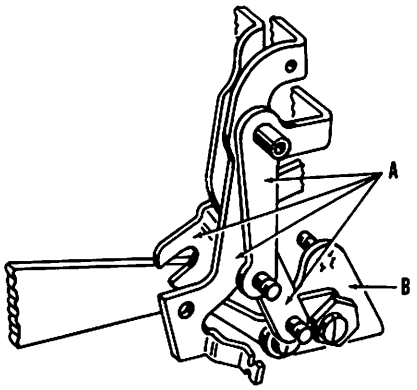


Fig. IX-53

(37) Maneuver the panel into its approximate position by guiding power total arm B to the inside of levers A then lowering the front end of the panel into position.

Note: A slight inward pressure should be applied to the panel with the left hand, while proceeding with steps 38 through 48.

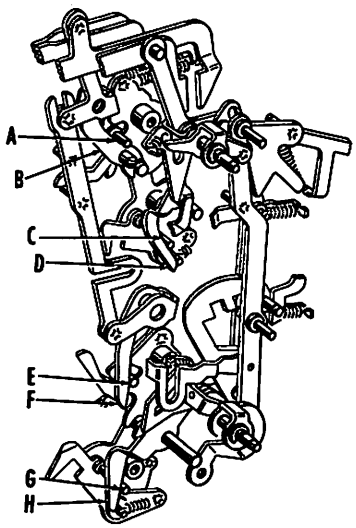


Fig. IX-54

(38) Position stud A to the rear of arm B, stud C to the rear of finger D, stud E to the rear of finger F and stud G to the rear of finger H.

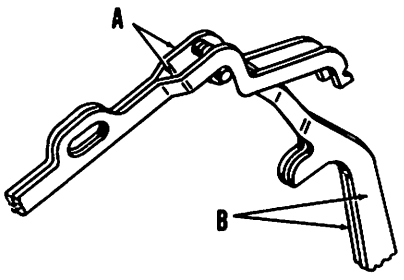


Fig. IX-55

(39) Raise the rearmost portion of slides A so they will rest on the studs in levers B.

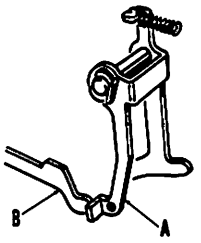


Fig. IX-56

(40) Position the rearmost portion of subtract slide B in front of the lip on bail A.

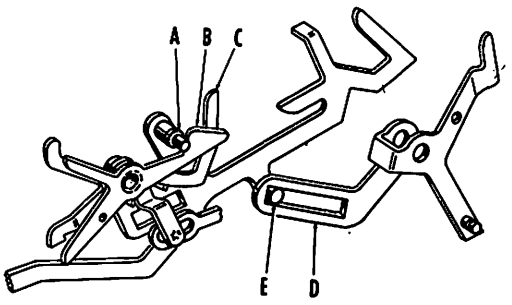


Fig. IX-57

(41) Position stud A over levers B and C, and roll E into the slot of lever D.

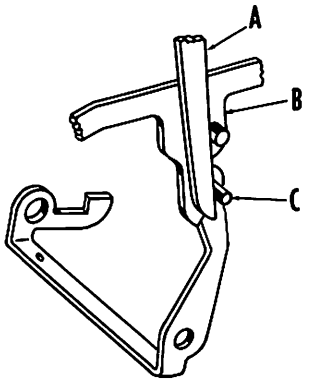


Fig. IX-58

(42) Position arms A and B in front of stud C in the red ribbon lift bail.

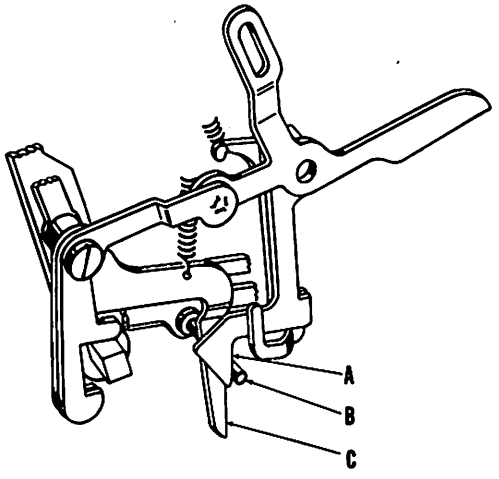


Fig. IX-59

(43) Position interlocks A and C in front of stud B.

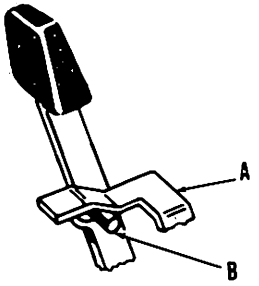


Fig. IX-60

(44) Position lip A above stud B.

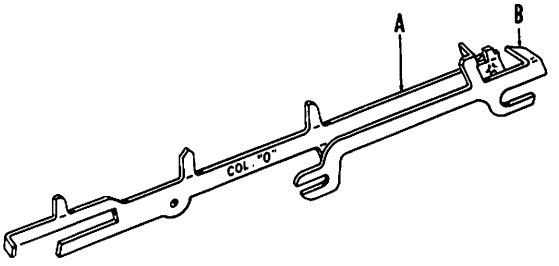


Fig. IX-61

(45) Position lip B on the minus balance symbol indexing slide behind index bar A.

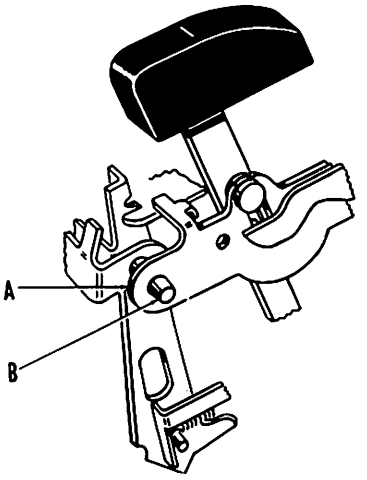


Fig. IX-62

(46) Insert shaft B into the hole in plate A.

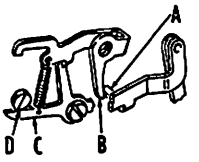


Fig. IX-63

(47) Position lip A to the rear of projection B, and projection C below keyboard retaining screw D.

(48) Replace the three panel anchoring screws (Steps 30, 31, and 32) but do not tighten.

Note: Before tightening the three anchoring screws it is advisable to check the position of the parts as outlined in steps 35 through 47 to assure that the panel is seated properly.

(49) Proceed with the replacement of parts by reversing steps 1 through 33.

M.R.C. UNIT - SERIES P 600 MACHINES

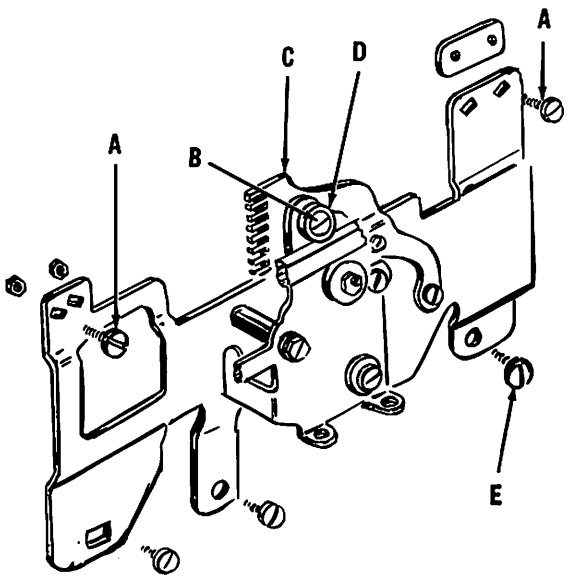


Fig. IX-64

A. Removal
1. Remove the rear case section and the tabulating spring covers.
2. Remove control arm guide C.
3. Break the knife connection in the wires from the M.R.C. switch.
4. Remove roll D.
5. Remove four screws A holding the M.R.C. unit to the carriage.
6. Remove three screws E holding the M.R.C. unit to the sub-base.
7. Remove the rubber molding from the rear of the base.
8. Move the bottom of the M.R.C. unit rearward and remove the M.R.C. unit from the machine.

B. Replacement
1. Install all parts removed by reversing the above procedure.
2. Adjust for the following condition:
   a. To support the carriage against upward strain from any source. Roll D should have slight rubbing contact on the carriage third rail when the carriage is in any stop position.
   TO ADJUST, turn eccentric screw B to raise or lower roll D.

C. Adjustments, New M.R.C. unit installation: Perform adjustments as outlined on pages 29 and 30, Section VII.

TABULATING CLUTCH ASSEMBLY

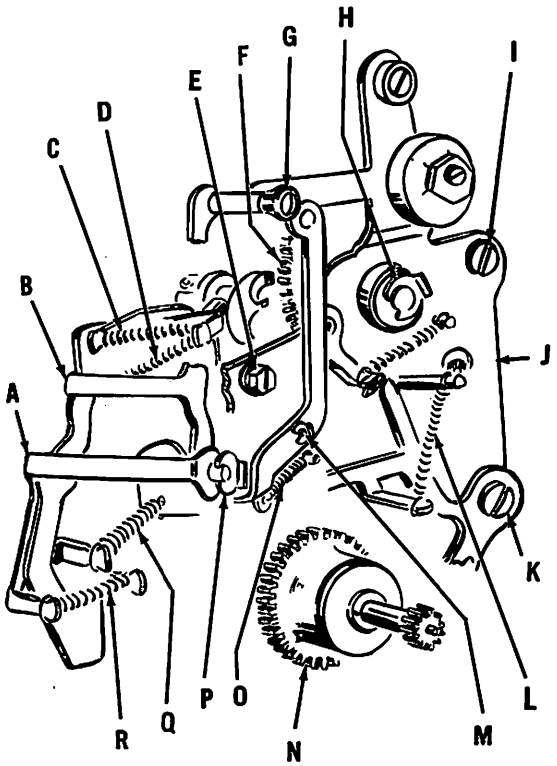


Fig. IX-65

A. Removal
1. Remove the M.R.C. unit (Figure IX-64).
2. Unhook springs C, D, L, O, Q and R.
3. Remove clip P and the space collar.
4. Remove clip H and the space washer.
5. Remove clip M.
6. Remove screws E, I and K.
7. Disconnect link G from bail A.
8. Pull bails A and B as far off their post as possible.
9. Lift off plate J.
10. Remove gear F.
11. Lift off clutch assembly N. Care should be taken not to knock off the springs in the clutch when the clutch shaft is removed from the clutch gear case.

B. Replacement
1. Install all parts removed by reversing the above procedure.

PRINTING HEAD - SERIES P 600

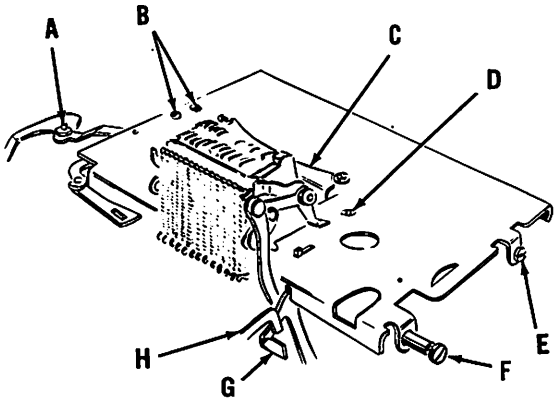


Fig. IX-66

A. Removal

1. Remove case (Figure IX-6), carriage (Figure IX-9) and M.R.C. unit (Figure IX-64).
2. Remove screw A to disconnect the date repeat link.
3. Remove two screws B and the calendar feature brace under the left side of the printing head.
4. Unhook and remove the hammer springs from the hammers.
5. Remove two screws and hammer latch guide C.
6. Remove screw D from the post supporting the printing head.
7. Remove screws E and F from the right side of the printing head.
8. Remove the two screws similar to screws E and F from the corresponding positions under the left side of the printing head.
9. Index the top row of keys on the keyboard. Without depressing a motor bar, pull the handle as far forward as possible and block the handle in this position.
10. Disengage slide H from formed ear G in the carriage opening interlock linkage and lift the printing head off the machine.

B. Replacement
1. Check the red ribbon lift arms to be in a rearward position.
2. Install all parts removed by reversing the above procedure.

CIPHER SPLIT MECHANISM - SERIES P 600

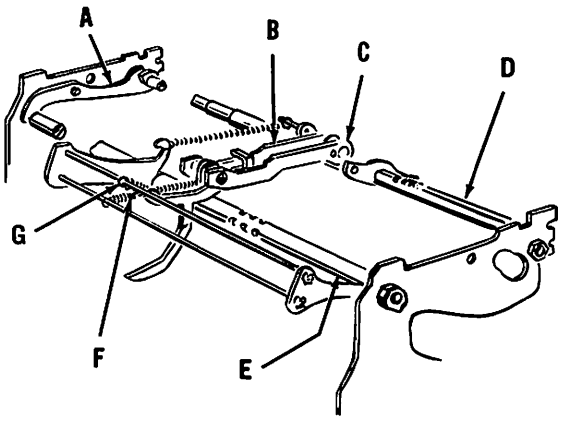


Fig. IX-67

A. Removal
1. Remove the printing head (Figure IX-66).
2. Unhook springs F and G.
3. Loosen the nuts on both ends of shafts D and E.
4. Remove the screw and locking plate A.
5. Turn shafts D and E approximately 1/4 turn to permit the removal of the cipher split mechanism.

6. Remove cipher split linkages B and C from the machine.

NOTE: When the Cipher Split Mechanism is located in the position immediately to the left of the Closed Account Mechanism, remove the closed account linkage with the right link of the cipher split mechanism.

B. Replacement

1. Install all parts removed by reversing the above procedure.

PRINTING CONTROL SHAFT - SERIES P 600

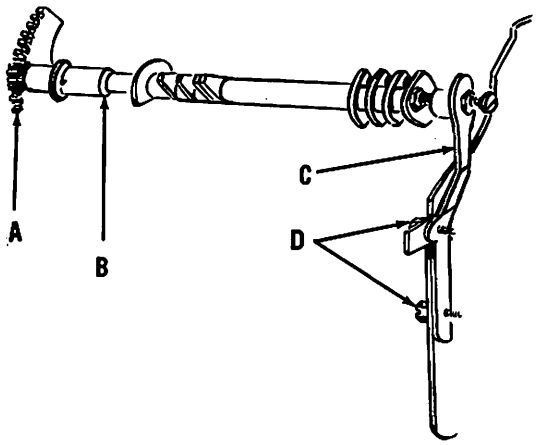


Fig. IX-68

A. Removal

1. Remove the M.R.C. unit (Figure IX-64).
2. Remove screws D and bracket C.
3. Remove printing control shaft B.

B. Replacement

1. Install all parts removed by reversing the above procedure.
2. Check the mark on the gear of the printing control shaft to be opposite the first (bottom) tooth of geared segment A for the printing control mechanism.

C. Check adjustments 1 through 4 as outlined on pages 40 and 41 Section VII for being correct.

LIFT ARM ASSEMBLY - REGISTER "B" SERIES P 400

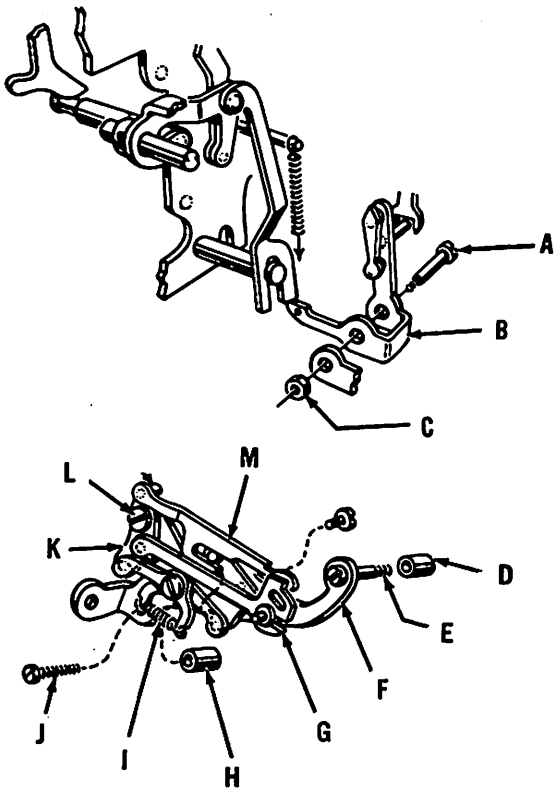


Fig. IX-69

A. Removal

1. Remove the carriage, case and base.
2. Remove nut C, screw A and Assembly B.
3. Remove screw E and collar D.
4. Remove spring I.
5. Remove screw J and collar H.
6. Remove bracket F containing the lift arm assembly.
7. Remove screw L that retains detent K.
8. Remove lift arms M and G with detent K.

B. Replacement

1. Install all parts removed by reversing the above procedure.

NOTE: When installing bracket F (containing the lift arm assembly) locate the latter in proper position and replace collar D and screw E.

REGISTER "B" - SERIES P 400

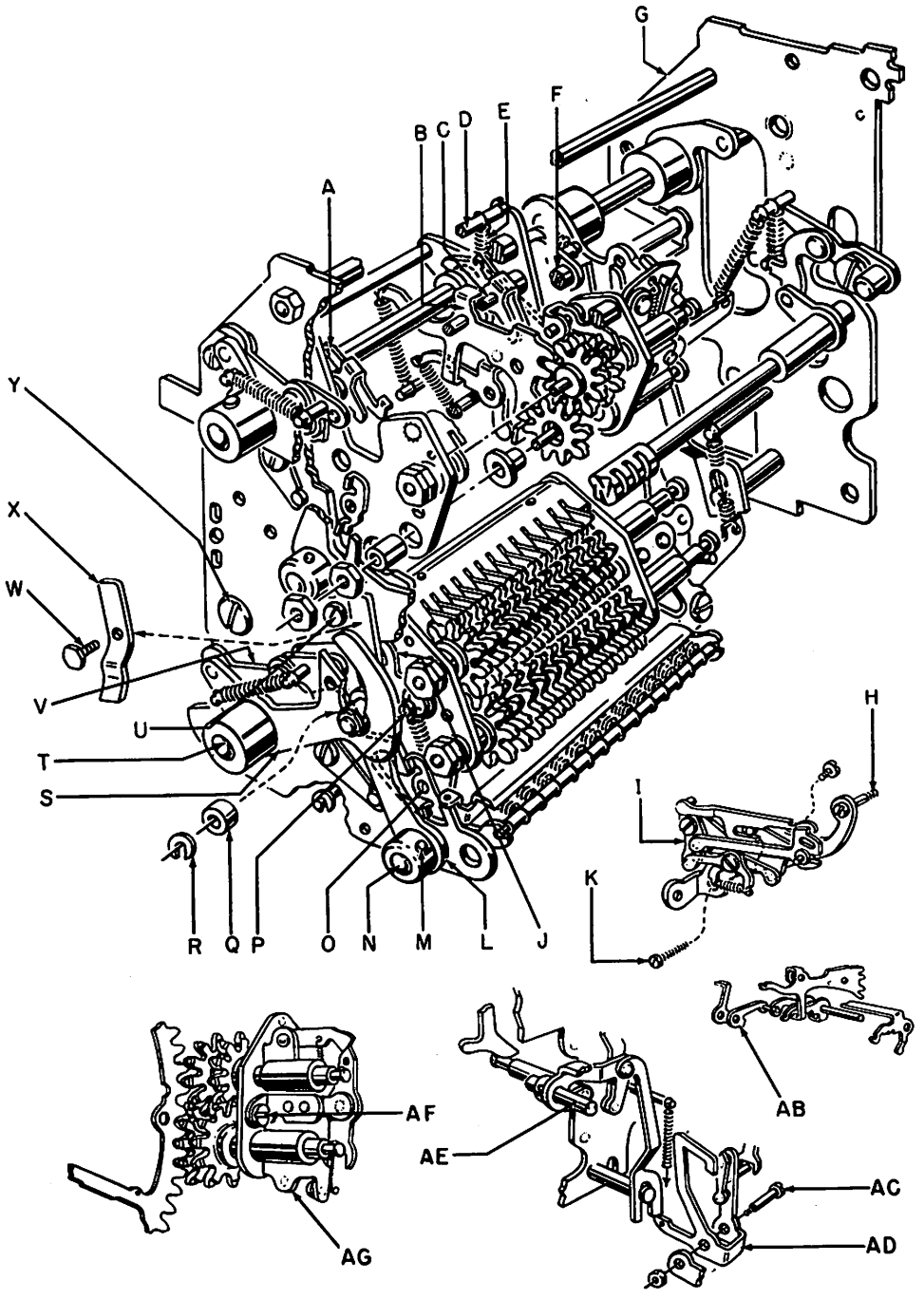


Fig. IX-70

A. Removal

1. Remove the carriage (Figure IX-19), case (Figure IX-6) and base (Figure IX-7).
2. Remove the motor and drive (Figure IX-75).
3. Remove the hammerhead (Figure IX-66) and accumulator section.

4. Remove accumulator sideframe G.
5. Remove lower screw AC and spearpoint assembly AD.
6. Remove lower screw AF and pinion shift mechanism AG.
7. Remove screws H and K, lift arm assembly I, and bellcrank AB.
8. Remove screw Y, shaft AE and spacer.
9. Position lower left drive cam S for accessibility to the screws that retain right and left linkage V, then remove the right and left screws, linkages V and shaft F.
10. Remove springs E and the spring shaft in register "B".
11. Remove retaining pin and lower left drive cam S.
12. Remove assembly T from right side of accumulator section.
13. Remove screw W and retaining plate X.
14. Remove clips R and rolls Q from right and left sides of accumulator section.
15. Remove retaining pin M and arm L from left side of accumulator section.
16. Remove assembly N from right side of accumulator section.
17. Remove lower spring anchor screw P.
18. Position retaining clip J so as to expose lower shaft C.
19. Remove lower shaft C and thin space washer, all carry pawl latches A.
20. Remove left lower screw O.
21. Position all carry racks B in carry position.
22. Remove register "B".

B. Replacement

1. Install all parts removed by reversing the above procedure.
2. Check adjustments 1 through 7, Page 25, Section VI.

CARRY RACK - SERIES P 400

A. Removal

1. Remove the carriage, case, and base.
2. Remove the motor and drive (Figure IX-75).
3. Remove screw O and retainer plate N.
4. Operate the machine sufficiently on a minus balance total to mesh the adding pinions with the adding sectors.
5. Remove clips Q and rolls P from right and left sides of the accumulator.

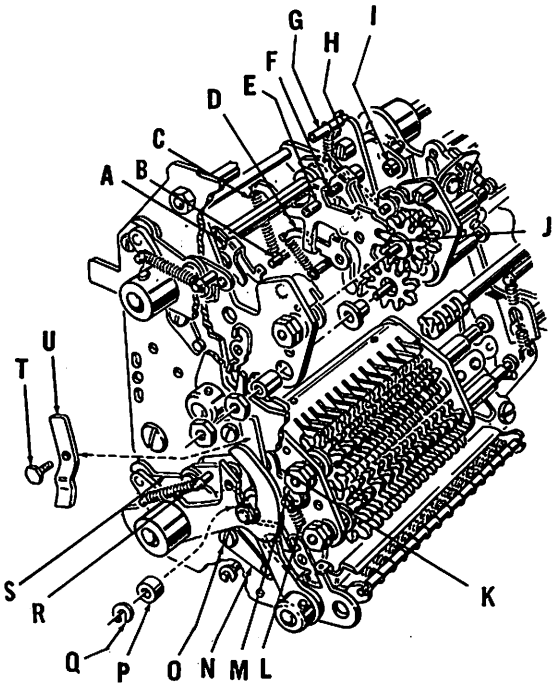


Fig. IX-71

6. Unhook spring L from spring anchor screw M.
7. Unhook spring R and remove arm assembly S.
8. Remove carry reset shaft I.
9. Remove screw T and guide U.
10. Remove screw M from left side and companion screw from right side.
11. Move shaft retainers K (on right and left sides) rearward and downward.
12. Unhook springs C and H and remove shafts B and G.
13. Push shafts E and F to the left (using two shafts 1-6900 as a follow up) far enough to clear the desired carry rack J.

NOTE: The carry pawl latch A above the carry rack to be removed, does not have to be removed.

14. Remove the desired carry rack J by applying downward and rearward movement.

B. Replacement

1. Install all parts removed by reversing the above procedure.

NOTE: Care should be taken that the tail of latch A is over the lip on the lowermost portion of the carry rack.

ADDING PINIONS - SERIES P 400

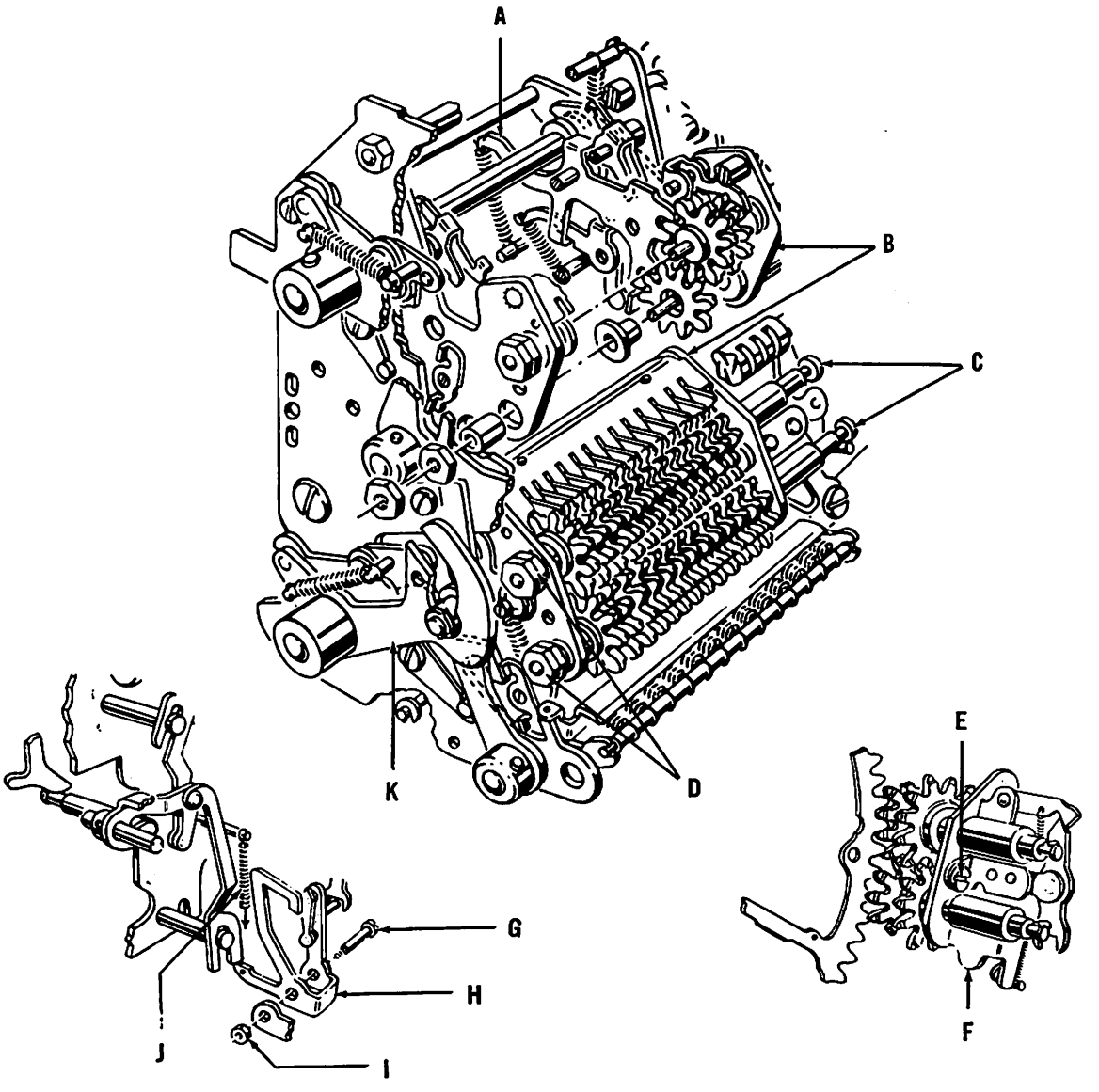


Fig. IX-72

A. Removal
1. Remove the carriage, base and case.
2. Remove the accumulator section.
3. Unhook spring J.
4. Remove nut I, screw G and bellcrank H.
5. Disengage the pinion assembly B from the carry racks A by manually depressing cam K.
6. Remove screw E and assembly F.
7. Return the pinion assembly B into engagement with carry racks A.
8. Remove nuts D.
9. Push shafts C to the right (using two 1/8" diameter shafts as a follow-up) to clear the desired adding pinion.

B. Replacement
1. Install all parts removed by reversing the above procedure.

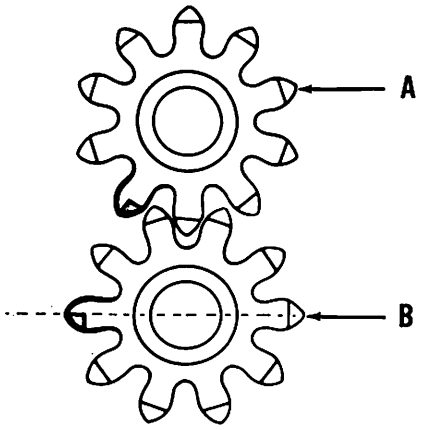


Fig. IX-73

NOTE: When assembling the adding pinions, the wide tooth of lower pinion B should be placed on a horizontal line pointing toward the front of the machine; and when upper pinion A is meshed with lower pinion B, the wide tooth of upper pinion A should be placed over the first tooth above the wide tooth of pinion B, as illustrated.

C. Check adjustments 1 through 7, page 25, Section VI.

AUTOMATIC REGISTER POWER SHIFT MECHANISM SERIES P 400

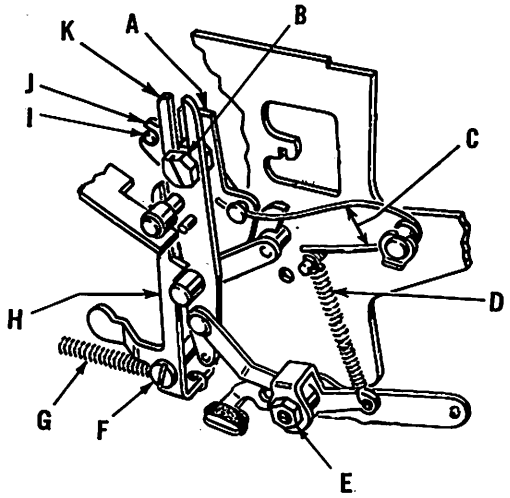


Fig. IX-74

A. Removal
1. Remove carriage, case and base.
2. Place O.C.L. No. 60 in "A" position and unlatch O.C.K. 7-0.
3. Stand the machine on its rearward end.
4. Unhook spring G.
5. Remove screw F and latch H.
6. Unhook spring D.
7. Remove shoulder nut E.
8. Pull the handle forward to position the full stroke pawl into the last notch of the full stroke segment.
9. Remove actuating arm K by moving its forward portion to the left and then pulling downward.
10. Disengage spring wire C from the stud in slide A.
11. Remove screw B with a long screw driver placed through the opening in the left sideframe.
12. Remove slide A.

B. Replacement
1. Install all parts removed by reversing the above procedure.

NOTE: (1) When tightening screw B, care should be taken that spring wire C does not get behind the head of screw B. (2) After screw B has been tightened, recheck fork J for being engaged with stud I.

C. Check adjustments 1 through 10, page 18, Section VI.

TYPE 3 MOTOR AND DRIVE ASSEMBLY

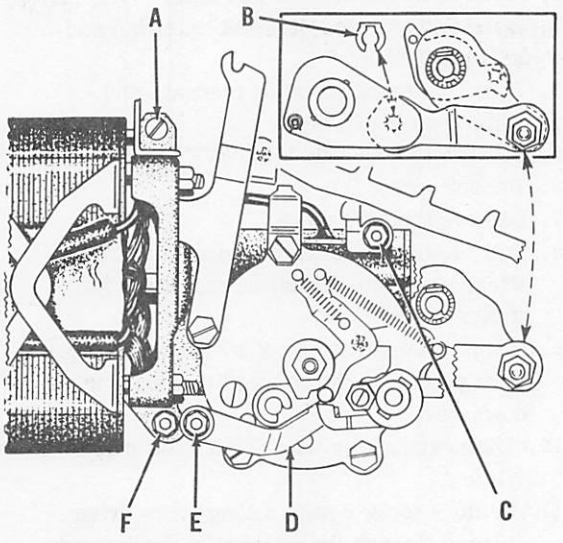


Fig. IX-75

A. Removal
1. Remove the carriage, case and base.
2. Disconnect slip connectors on plug receptacle.
3. Remove nut E and drive trip arm D.
4. Remove nuts C and F.
5. Remove screw A.
6. Remove clip B on drive linkage.
7. Remove the motor and drive assembly.

B. Replacement
1. Install all parts removed by reversing the above procedure.

TYPE P2 MOTOR AND DRIVE ASSEMBLY

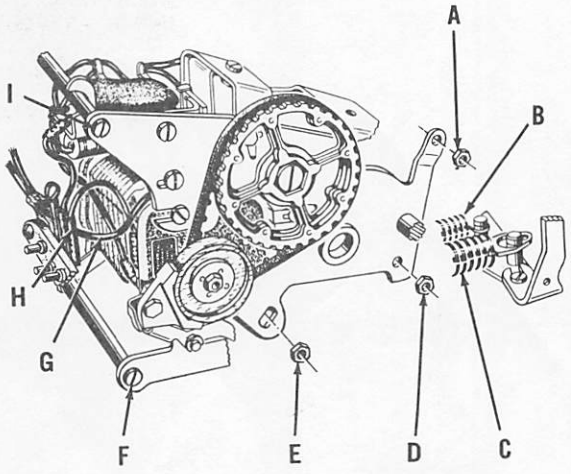


Fig. IX-76

A. Removal
1. Remove carriage, case and base.
2. Disconnect slip connectors H and wire G.
3. Unhook springs B and C.
4. Remove nuts A, D and E.
5. Remove screws F and I.
6. Remove retaining clip from forward end of drive link.
7. Remove motor and drive assembly.

B. Replacement
1. Install all parts removed by reversing the above procedure.

RIBBON INSTALLATION - SERIES P 600

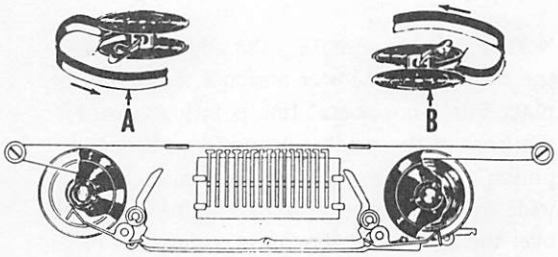


Fig. IX-77

A new ribbon should be installed in the machine in such a manner as to permit the square opening in the hub of the ribbon spool to be completely clear when all of the ribbon is unwound from either spool.

When the new ribbon is wound on its spool as shown in A, it should be installed on the left ribbon post and the free end attached to the empty spool as shown in A.

After the new ribbon is attached to the empty spool, it should be threaded in the machine as illustrated and the spools installed on the ribbon posts.